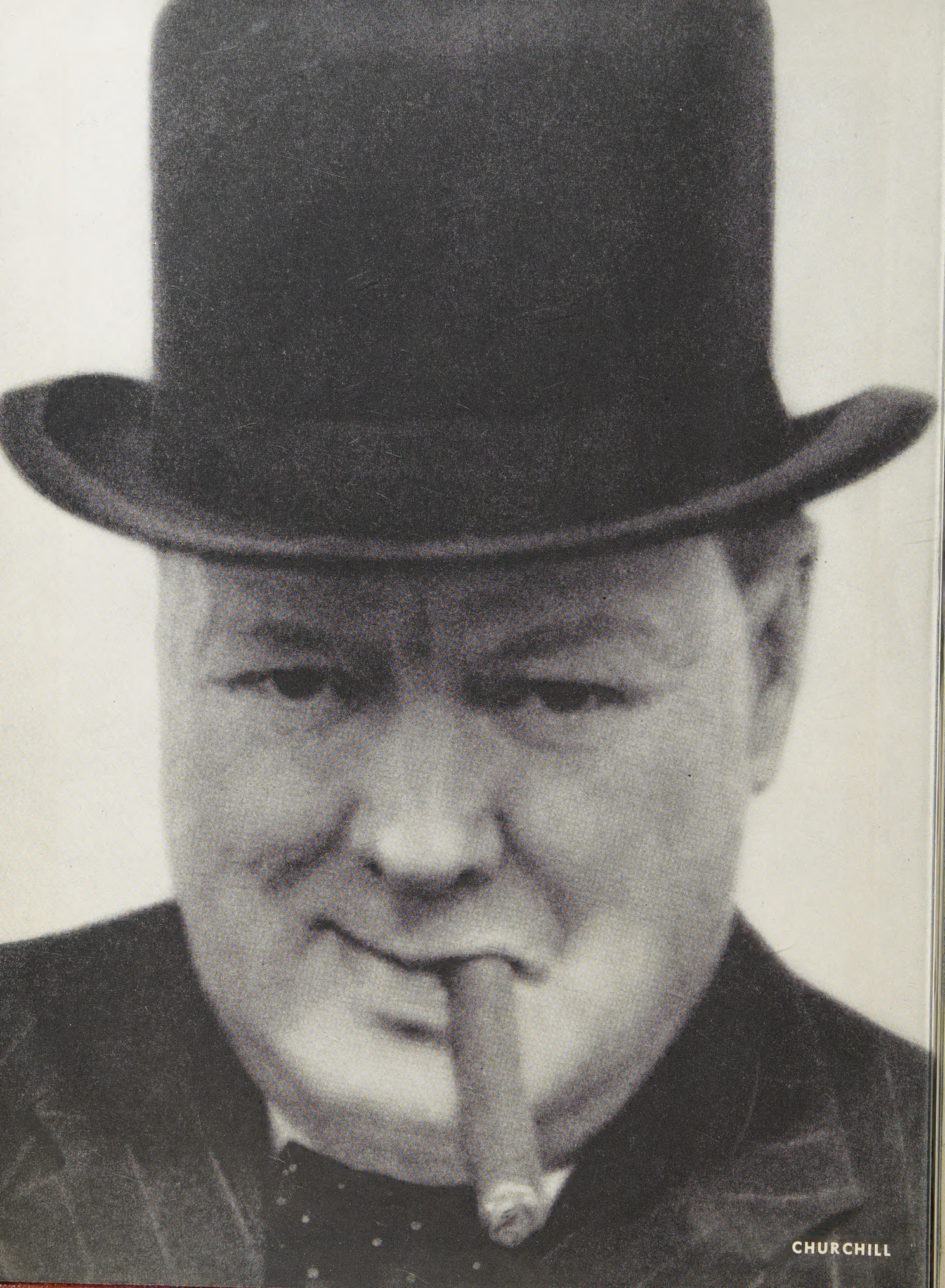
1941 BRITANNICA BOOK OF THE YEAR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A Record of the March of Events of 1940

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INTRODUCTION

MORE *than five hundred distinguished contributors are represented in this fourth issue of the Britannica Book of the Year. The physical proportions of the volume are the same as in other years. Because official statistical data of production and finance were not generally disclosed by the governments of European and other warring countries, it seemed inadvisable in a number of instances to attempt to estimate them this year. Also, in order to make room for complete and comprehensive coverage of the war, material which needed, according to the judgment of the authors, little or no change as against the record of the preceding year has been condensed. The cumulative index at the back of the book is a guide to such material in earlier volumes.*

Franklin H. Hooper, for forty odd years associated with Britannica and for many of them Editor and Editor Emeritus, passed away during 1940. His life was one of much work and rich service to people. His strength lay in the fact that he believed profoundly in man's ability to take care of himself ultimately. For all his years—and years have a way of making one cautiously conservative—Mr. Hooper was not afraid of change or of new ideas, although he did not deny the value of some old ideas. Problems never discouraged him. Obstacles were an inspiration. He tackled fresh tasks with the enthusiasm of a much younger man and always got them done.

This issue of the Britannica Book of the Year is dedicated to the memory of Mr. Hooper, who edited the first issue in 1938. He was a great American, a renowned encyclopaedist, and a liberal with the true liberal's serenity and optimism. He knew the world well. It couldn't fool him. A year's trials—even a dark year like 1940—could mean little more to him than that, in the long view, man's destiny remains unmistakable. It moves through suffering toward tolerance, free inquiry, final peace.

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L.C.DeA.	**LOUIS C. De ARMOND, A.B.** Department of History, University of California, Berkeley, California.	**Costa Rica** (*in part*) **Cuba** (*in part*) **Panama** (*in part*) **Puerto Rico** (*in part*)
L.C.S.	**LOUIS CARTER SMITH, B.S., LL.B., LL.M.** Secretary-Treasurer, National Archery Association of the United States, Boston, Mass.	**Archery**
L.de B.H.	**L. de BREDA HANDLEY.** Honorary coach, Women's Swimming Association of New York. Author of *Swimming for Women;* etc.	**Swimming**
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L.Ef.	**LOUIS EFFRAT.** Member of *The New York Times* sports staff.	**Billiards**
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P.R.H.	**PAUL R. HANNA, A.M., Ph.D., Pe.D.** Professor of Education, Stanford University, California.	**Education, Elementary** (*in part*)
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R.A.Ga.	**RUTH A. GALLAHER, Ph.D.** Associate editor of the State Historical Society of Iowa. Author of *Legal and Political Status of Women in Iowa,* etc.	**Iowa**
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R.B.W.	**R. B. WHITE.** President, The Western Union Telegraph Company, New York.	**Telegraphy**

R.Co.	**REGINALD COUPLAND, C.I.E., M.A., Hon.D.Litt.** Fellow of All Souls and Nuffield Colleges, Oxford; Beit Professor of Colonial History, Oxford, since 1920; author of *East Africa and Its Invaders; The Exploitation of East Africa*, etc.	**British East Africa** (*in part*) **British South African Protectorates** (*in part*) **British West Africa** (*in part*) **Rhodesia** (*in part*)
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R.Fs.	**ROBERT FOSS.** Editor, University of Wisconsin News Bureau, Madison, Wisconsin.	**Wisconsin, University of**
R.G.Ha.	**ROSWELL GRAY HAM, Ph.D., LL.D.** President of Mount Holyoke College, South Hadley, Mass.	**Mount Holyoke College**
R.G.Hu.	**RAY G. HULBURT, D.O.** Editor, *The Journal of the American Osteopathic Association.*	**Osteopathy**
R.Git.	**ROY GITTINGER, Ph.D., LL.D.** Dean of Administration and Professor of English History, University of Oklahoma, Norman.	**Oklahoma**
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T.C.Pe.	**THEODORE C. PEASE, Ph.B., Ph.D.** Professor of History, University of Illinois, Urbana.	Illinois
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V.R.	**VIOLA RIPLEY, B.Sc.** Assistant Lecturer in Biology, Huddersfield Technical College, Huddersfield, England, 1926–28.	Zoological Gardens
V.S.	**VILHJALMUR STEFANSSON, A.M., Ph.D., LL.D.** Geographer, Anthropologist; Commander of several arctic expeditions; since 1932 adviser on northern operations to Pan American Airways.	Exploration and Discovery
W.A.Ha.	**WILLIAM A. HAMOR.** Assistant Director of Mellon Institute of Industrial Research.	Industrial Research, etc.
W.A.J.	**WALTER A. JESSUP, M.A., Ph.D., LL.D., Litt.D.** President, Carnegie Foundation for the Advancement of Teaching, New York.	Universities and Colleges (*in part*)
Wa.Wal.	**WALTMAN WALTERS, M.D., Sc.D.** Professor of Surgery, Mayo Foundation, University of Minnesota.	Surgery
W.B.Pu.	**WILLIAM BARROW PUGH, D.D., LL.D.** Stated Clerk, The Presbyterian Church in the United States of America.	Presbyterian Church
W.C.	**WILLIAM CROCKER, A.B., A.M., Ph.D.** Director, Boyce Thompson Institute for Plant Research, Inc., Yonkers, N.Y.	Botanical Gardens
W.Cl.	**WALTER CLARK, Ph.D.** Vice-President in Charge of Research and Development for the Eastman Kodak Company Author of *Photography by Infrared: Its Principles and Applications*.	Photography
W.D.L.	**WILLIAM DRAPER LEWIS, LL.B., Ph.D.,** Director, American Law Institute, Philadelphia, Pennsylvania.	American Law Institute
W.D.Ma.	**WILLIAM D. MARTIN, A.F.I.A.** (Australia). Economic and Statistical Research Section, Intelligence Branch, Australia House, London, since 1927.	Australia, Commonwealth of New South Wales Northern Territory Queensland South Australia Tasmania Victoria Western Australia
W.D.Mn.	**WILLARD D. MORGAN, B.A.** Writer, Photographer, Publisher. Founder and partner of firm, Morgan and Lester, New York. Associate editor of *U.S. Camera Magazine*.	Photography, Miniature Camera
W.E.Ga.	**W. E. GARRISON, Litt.D., B.D., Ph.D.** Professor of Church History, Disciples Divinity House and Associate Professor of Church History, University of Chicago, Chicago.	Disciples of Christ
W.E.O.	**WILLIAM E. OGILVIE.** Assistant Manager, International Live Stock Exposition, Chicago.	Shows (*in part*)
W.E.Ss.	**WAYNE EDSON STEVENS, M.A., D.Ph.** Professor of History, Dartmouth College, Hanover, New Hampshire.	New Hampshire
W.F.B.	**WALTER F. BOGNER.** Architect. Associate Professor of Architecture, School of Design, Harvard University.	Architecture
W.F.Br.	**WILLIAM F. BRAASCH, M.D.** Mayo Clinic, Rochester, Minnesota. Professor of Urology, University of Minnesota Graduate School. Editorial Committee, *Journal of Urology*.	Urology
W.G.Ca.	**WALTER G. CAMPBELL, LL.B.** Chief, Food and Drug Administration, Federal Security Agency, Washington.	Drugs and Drug Traffic (*in part*)
W.H.Ch.	**WILLIAM HENRY CHAMBERLIN.** Author and journalist, former correspondent for *The Christian Science Monitor* in the Soviet Union, the Far East and France.	Japan, etc.
W.H.G.	**WALTON HARLOWE GREEVER, A.M., D.D., LL.D.** Secretary of The United Lutheran Church in America, New York.	Lutherans
W.J.Bt.	**W. J. BRETT.** Editor, *Fur Trade Review*, New York.	Furs
W.J.C.	**WILLIAM J. CUNNINGHAM, A.M.** Professor of Transportation, Harvard University, Graduate School of Business Administration, Boston.	Railroads (*in part*)
W.Ju.	**WILL JUDY.** Editor of *Dog World*.	Shows (*in part*)
W.L.Be.	**WILLIAM L. BENEDICT, M.D.** The Mayo Clinic, Rochester, Minn. Professor of Ophthalmology, University of Minnesota Graduate School.	Eye, Diseases of
W.L.Pi.	**WARREN LEE PIERSON, LL.B.** President, Export-Import Bank of Washington.	Export-Import Bank of Washington
W.L.S.	**WILLIAM LOMMER STURDEVANT.** Director of Information, Tennessee Valley Authority, since 1933.	Tennessee Valley Authority
W.L.T.	**W. L. TREADWAY, M.D.** Medical Director, U. S. Public Health Service, University of California Medical School, San Francisco, California.	Intoxication, Alcoholic
W.L.Wr.	**W. LLOYD WARNER, A. B.** Associate Professor of Anthropology and Sociology, University of Chicago. Author of *Black Civilization*, etc.	Anthropology
W.McM.	**WHEELER MCMILLEN, LL.D.** Editor in Chief, *Farm Journal* and *Farmer's Wife*.	Chemurgy
W.P.C.	**WILLIAM PITCHER CREAGER, C.E.** Consulting Hydraulic Engineer. Author of *Engineering for Masonry Dams*, etc.	Dams
W.P.Hl.	**WALTER P. HALL, Ph.D.** Dodge Professor of History, Princeton University, Princeton, N. J.	Italy
W.Pr.	**WALTER PRICHARD, M.A.** Officier d'Academie. Professor and Head of the Department of History, Louisiana State University, University, La. Editor, *Louisiana Historical Quarterly*.	Louisiana
W.P.S.	**WARREN P. SPENCER, Ph.D.** Professor of Genetics, College of Wooster, Wooster, Ohio.	Genetics
W.S.Ad.	**WALTER S. ADAMS, A.M., D.Sc., LL.D.** Director Mount Wilson Observatory of the Carnegie Institution.	Telescopes
W.S.G.	**WALTER S. GIFFORD, A.B., LL.D.** President, American Telephone and Telegraph Company, New York.	Telephone
W.S.To.	**WALTER S. TOWER, M.A., Ph.D.** President, American Iron and Steel Institute, New York.	American Iron and Steel Institute
W.T.M.	**WILLIAM T. MANNING, D.C.L., LL.D.** Bishop of New York.	Protestant Episcopal Church
W.T.St.	**W. TETLEY STEPHENSON, M.A., M.Inst.T.** Lecturer and Cassel Reader in Transport at the London School of Economics and Political Science, 1906–39	Motor Transportation (*in part*)
W.W.B.	**WILLARD W. BEATTY.** Director of Education, Office of Indian Affairs, U. S. Department of the Interior, Washington.	Indians, American
W.Wh.	**WALTER WHITE, B.A.** Secretary, National Association for the Advancement of Colored People, New York.	Lynchings
X	**ANONYMOUS.**	

1940

JANUARY							JULY						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
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21	22	23	24	25	26	27	21	22	23	24	25	26	27
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FEBRUARY							AUGUST						
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11	12	13	14	15	16	17	11	12	13	14	15	16	17
18	19	20	21	22	23	24	18	19	20	21	22	23	24
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MARCH							SEPTEMBER						
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APRIL							OCTOBER						
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MAY							NOVEMBER						
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JUNE							DECEMBER						
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1941

JANUARY							JULY						
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FEBRUARY							AUGUST						
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MARCH							SEPTEMBER						
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APRIL							OCTOBER						
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20	21	22	23	24	25	26	19	20	21	22	23	24	25
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MAY							NOVEMBER						
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JUNE							DECEMBER						
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1942

JANUARY							JULY						
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18	19	20	21	22	23	24	19	20	21	22	23	24	25
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FEBRUARY							AUGUST						
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MARCH							SEPTEMBER						
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22	23	24	25	26	27	28	20	21	22	23	24	25	26
29	30	31	..	..	..	..	27	28	29	30	..	..	..

APRIL							OCTOBER						
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19	20	21	22	23	24	25	18	19	20	21	22	23	24
26	27	28	29	30	..	..	25	26	27	28	29	30	31

MAY							NOVEMBER						
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JUNE							DECEMBER						
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28	29	30	..	..	..	..	27	28	29	30	31	..	..

THE year 1941 of the Christian Era corresponds to the year of Creation 5701–5702 of the Jewish calendar; to the year 1359–60 of the Mohammedan hegira; to the 165th of the United States; and to the 173rd year of the *Encyclopædia Britannica*.

JANUARY, 1941

1 New Year's day.
1 Union of 6 Australian colonies as commonwealth of Australia, 40th anniversary.
3 U.S. congress convenes.
6 Epiphany, or Twelfth Night.
8 Jackson day.
13 Festival of St. Veronica.
20 Eve of St. Agnes.
20 Inauguration of Franklin D. Roosevelt for third term as president of U.S.A.
22 Feast of St. Chrysostom.
23 Centenary, birth of Coquelin the Elder, French actor.
26 Foundation day, Australia.
28 Mohammedan year 1360 begins.

FEBRUARY

2 Candlemas. Purification of the Virgin.
2 Ground-Hog day.
8 Boy Scout day, U.S.A.
9 Septuagesima Sunday.
12 Birth of Abraham Lincoln, 1809.
14 St. Valentine's day.
22 Washington's birthday, 1732.
23 Quinquagesima (Shrove Sunday).
24 Feast of St. Matthias.
25 Shrove Tuesday. Mardi Gras.
26 Ash Wednesday. Beginning of Lent.

MARCH

1 St. David's day, patron saint of Wales.
2 Texas Independence day.
4 Admission of Vermont to union, 150th anniversary.
8 Centenary, birth of Oliver Wendell Holmes, American jurist.
12 Girl Scout day, U.S.A.
13 Partial eclipse of moon.
17 St. Patrick's day, patron saint of Ireland.
21 Equinox. Beginning of spring.
25 Annunciation. Quarter day.
27 Annular eclipse of sun.
30 Seward day, Alaska.

APRIL

1 All Fools' day.
6 Greek Independence day.
6 Palm Sunday.
10 Maundy Thursday.
11 Good Friday.
12 Jewish Passover, 1st day.
13 Easter Sunday.
14 Pan-American day.
17 American Academy of Arts and Letters, 25th anniversary.
23 St. George's day.
25 St. Mark's day.
26 Confederate Memorial day (also May 10, May 30, June 3).
27 Daylight-saving time begins (U.S.A.).

MAY

1 May day. International labour festival.
5 Cinco de Mayo, Mexican holiday.
9 Annexation of Abyssinia by Italy, 5th anniversary.
11 Mother's day, U.S.A.
18 Peace day.
18 Rogation Sunday.
22 Ascension day.
24 Empire day. Queen Victoria born, 1819.
27 St. Bede's day.
30 Memorial or Decoration day, U.S.A.
31 Battle of Jutland, 25th anniversary.
31 Union day, South Africa.

JUNE

1 Pentecost (Whitsunday).
1 Shebuoth (Jewish Pentecost).
8 Children's day, U.S.A.
8 Trinity Sunday.
9 Trooping the colour in honour of King George VI's birthday. His majesty was actually born on Dec. 14.
10 Centenary, birth of Sir Henry M. Stanley, British explorer.
11 Feast of St. Barnabas.
12 Corpus Christi.
14 Flag day.
15 Father's day, U.S.A.
21 Solstice. Beginning of summer. Longest day.
22 First anniversary, signing of Franco-German armistice.
24 St. John's day.
26 Assassination of Francisco Pizarro, 400th anniversary.
30 St. Paul's day.

JULY

1 Canada, Dominion day.
4 Independence day.
14 Bastille day.
15 Alaska discovered by Chirikov, 200th anniversary; Mt. St. Elias sighted next day (July 16, 1741) by Bering.
15 St. Swithin's day.
22 Feast of St. Mary Magdalene.
26 St. Anne's day.
27 First successful Atlantic cable landed at Newfoundland, 75th anniversary.

AUGUST

1 Swiss Independence day, 650th anniversary.
6 Feast of the Transfiguration.
10 Admission of Missouri to union, 120th anniversary.
10 Feast of St. Lawrence.
15 Assumption.
24 Feast of St. Bartholomew.

SEPTEMBER

1 Labor day, U.S.A
1 Second anniversary, beginning of European war.
5 Partial eclipse of moon.
8 Centenary, birth of Anton Dvořák, Bohemian composer.
11 Centenary, birth of Arthur Young, British economist and author.
16 Mexican Independence day.
17 Constitution day.
18 Beginning of Japanese occupation of Manchuria, 10th anniversary.
21 Total eclipse of sun; path of eclipse across central Asia.
22 Rosh Hashanah (Jewish New Year), beginning year 5702.
23 Autumnal equinox.
26 Dominion day, New Zealand.
28 Centenary, birth of Georges Clemenceau, French statesman.
28 Daylight-saving time usually ends (U.S.A.).
29 Michaelmas. Quarter day.
30 Feast of St. Jerome.

OCTOBER

1 Yom Kippur (Jewish Day of Atonement).
3 Mars nearest earth.
4 Feast of St. Francis of Assisi.
6 Succoth (Jewish Feast of Tabernacles), 1st day.
12 Columbus day.
21 Trafalgar day.
25 St. Crispin and St. Crispinian.
27 Navy day, U.S.A.
31 Hallowe'en.

NOVEMBER

1 All Saints' day. All Hallows.
4 Election day, in certain states, U.S.A.
5 Guy Fawkes day.
9 Centenary, birth of Edward VII of England.
9 Lord Mayor's show, London.
10 Centenary, birth of Joaquin Miller, American poet.
11 Armistice day.
16 Feast of St. Edmund.
20 Thanksgiving day (subject to presidential proclamation), U.S.A.; also Nov. 27.
30 First Sunday in Advent. Beginning of ecclesiastical year.
30 St. Andrew's day, patron saint of Scotland.

DECEMBER

5 U.S.S.R. Constitution day.
8 Immaculate Conception.
11 Admission of Indiana to union, 125th anniversary.
17 Aviation day, U.S.A.
21 Forefathers' day.
22 Solstice. Beginning of winter. Shortest day.
25 Christmas.
26 Boxing day. English bank holiday.
29 Greatest brilliancy of Venus.

CALENDAR OF EVENTS, 1940

For elections, disasters and assassinations of 1940, see under those headings in the text. For obituaries of prominent persons who died during 1940, see under the entry Obituaries.

JANUARY

1 **Vladimir Sokoline,** under-sec'y general of the League of Nations, only Russian on the staff, was dismissed.

2 **The U.S. supreme court,** in a unanimous decision, ruled that there could be no appeal to the courts from a decision of the National Labor Relations board designating the union which was to negotiate with an employer.

Cordell Hull, U.S. sec'y of state, made a formal protest to Great Britain against the removal from British and neutral vessels on the high seas of American mail addressed to neutral countries.

The Republican national committee reported to the clerk of the house of representatives that it had collected $1,092,037 in 1939; the Democratic national committee reported collection of $731,116.

3 **Pres. Roosevelt** in his annual message to congress said that the nation was committed to peace, defended the trade agreements made by the department of state and asked for larger appropriations for national defence with some new taxes.

The Federal Communications commission recommended consolidation of the Western Union and Postal Telegraph companies.

The congressional committee on un-American activities reported that neither John L. Lewis nor the Congress of Industrial Organizations was communistic, but that several unions in the C.I.O. were tainted with communism.

4 **Pope Pius XII** appointed the Most Rev. Samuel A. Stritch, archbishop of Milwaukee, to succeed the late Cardinal Mundelein as archbishop of Chicago.

Pres. Roosevelt in his budget message recommended the expenditure of $8,424,000,000 for the fiscal year 1941, including $1,800,000,000 for national defence, advised raising $460,000,000 by new taxes and estimated the deficit at $1,716,000,000.

The Irish parliament authorized the gov't to intern without trial members of the Irish Republican army.

Pres. Roosevelt nominated Attorney-General Frank Murphy to succeed the late Pierce Butler as associate justice of the supreme court and Solicitor General Robert H. Jackson to succeed Mr. Murphy in the cabinet.

5 **Leslie Hore-Belisha,** sec'y of state for war in the British cabinet, resigned and was succeeded by Oliver Stanley, promoted from the presidency of the board of trade.

Premier Hubert Pierlot of Belgium submitted his resignation to the king and was immediately commissioned to form a new cabinet.

6 **The surgeon general of the health service** reported that the death-rate in the U.S.A. for 1938 was the lowest in history.

8 **U.S.A. and Australia** announced establishment of direct diplomatic relations, with Richard G. Casey as first Australian minister to Washington and Clarence E. Gauss as first U.S. minister to Canberra.

Rationing of bacon, ham, butter and sugar began in Great Britain.

Pres. Roosevelt said at Jackson day dinner that future belongs to political leaders who can win support of independent voters.

Kenneth Crawford elected president of American Newspaper guild.

10 **House of representatives** passed Gavagan anti-lynching bill by vote of 252 to 131 with 124 Democrats voting against it.

RFC and Export-Import bank arranged for loan of $10,000,000 to Norway for purchase of U.S. agricultural products and manufactured goods.

12 **Pres. Cárdenas** of Mexico declared that Monroe Doctrine ceased to exist in its original form when the American republics agreed in 1936 to protocol against intervention by one country in affairs of another.

13 **It was announced in Sofia** that Bulgaria and Turkey had reached an agreement for maintenance of peace and neutrality in the Balkans.

14 **Gen. Nobuyuki Abe,** Japanese premier, resigned and Adm. Mitsumasa Yonai was commissioned to form new cabinet.

Federal Bureau of Investigation announced the arrest in New York of 18 members of so-called Christian Front, charged with "plotting to overthrow the gov't of the U.S."

15 **British foreign office,** in formal answer to the American nations which decreed neutrality zone extending 300 mi. around western hemisphere, declared that it was impractical to enforce neutrality in the zone.

Pres. Roosevelt reported to congress that $11,776,501,570 had been spent for relief since April 1935, and asked for authority to develop a national playground in the Tennessee valley.

16 **Rear Adm. Byrd** notified the navy department that his ships, the "Bear" and "North Star," had arrived at the Bay of Whales in Little America in the antarctic.

18 **A trade treaty** between France and Spain was signed in Madrid containing an agreement for the purchase of certain commodities of each country by the other.

30,000 Russians reported retreating from the Salla sector in Finland after an unsuccessful attempt to force their way through to the Gulf of Bothnia.

19 **French senate** approved by unanimous vote bills passed by chamber of deputies Jan. 16, excluding from parliament and municipal gov't all communists who had not withdrawn from that party before Oct. 26.

20 **Great Britain** refused to abandon practice of examining mail addressed to neutral countries, carried in American or neutral ships.

22 **Celebration of 100th anniversary** of landing of first white settlers in New Zealand began at Wellington.

Earl Browder, sec'y of U.S. Communist party, convicted of obtaining passport by fraud, sentenced to four years' imprisonment and fined $2,000.

Ignace Jean Paderewski elected president of the Polish gov't set up by exiles in France.

23 **House of representatives** voted to extend life of its committee on un-American activities for a year.

24 **John L. Lewis,** in address at United Mine Workers' annual convention in Columbus, O., said that the national administration had broken faith with labour and that Pres. Roosevelt would be ignominiously defeated if he ran for a third term.

25 **The Canadian parliament** met, listened to speech from throne and adjourned to enable gov't to appeal to country for approval of its war policy which had been severely criticized.

26 **Gov. Bottolfsen** of Idaho appointed John W. Thomas to the U.S. senate to succeed the late W. E. Borah.

U.S.-Japanese trade treaty, denounced by the U.S.A. July 26, 1939, expired at midnight.

27 **Russian attempt** to get behind the Mannerheim line around Lake Ladoga with 70,000 men repulsed by the Finns.

A decree issued in Madrid restored to the Jesuits the property in Spain confiscated by the gov't in 1932.

British censorship was relaxed to permit announcement that Great Britain had been experiencing record cold wave.

Six persons were killed in a riot between Hindus and Moslems in Rangoon, Burma.

29 **U.S. supreme court** sustained validity of New York city tax of 2% on the sale of goods moving into the city from outside the state.

A torpedo boat, the first ship in the new Irish navy, was turned over to the high commissioner of Ireland at a London shipyard.

30 **Pres. Roosevelt** asked congress to appropriate between $7,500,000 and $10,000,000 to the public health service to build 50 hospitals in rural regions.

31 **Pres. Cárdenas** of Mexico announced that it was the intention of the gov't to pay the oil companies for their property which it had expropriated.

Joint Soviet-Mongolian and Japanese-Manchoukuoan boundary commission announced failure to agree on a boundary between Mongolia and Manchoukuo.

The convention of the United Mine Workers of America authorized its executive board to endorse a candidate for president and to contribute to his campaign fund.

FEBRUARY

1 **The 150th anniversary** of the first session of the U.S. supreme court was observed by the court in Washington with addresses by the chief justice, the attorney-general and the president of the American Bar association.

Pres. Kjösti Kallió of Finland in an address to parliament said that Russia's "barbarous attacks" upon his country were senseless and that he was ready to negotiate an honourable peace.

4 **Foreign ministers** of Rumania, Greece, Turkey and Yugoslavia, meeting in Belgrade, agreed to extend existing entente for seven years and to exert themselves to preserve neutrality of their countries.

Leaders of ten of the strongest unions in the American Federation of Labor, attending meeting of executive council in Miami, Fla., issued a statement declaring that the New Deal had failed to solve the economic problems of the country.

The U.S.A. entered into diplomatic relations with Saudi Arabia for the first time when Bert Fish, the American minister, presented his credentials to King Ibn Saud.

5 **Mussolini** ordered irrigation of 1,200,000 ac. in Italy.

Governing body of International Labour Organization, sitting in Geneva, declared the seat of the Russian delegate vacant.

7 **Delegates** of ten nations met at The Hague to study problems of world reconstruction.

Two members of the outlawed Irish Republican army were hanged in Birmingham, England, after conviction on the charge of killing people with bombs.

8 **Turkish gov't** took possession of the Krupp shipyard at Istanbul, dismissed the German employees and put Turkish marines in charge.

The administrative board of the Catholic Welfare conference, meeting in Washington, issued a proclamation calling for the establishment of some form of vocational groups which would bind men together and create a moral unity.

U.S. sec'y of state informed congress that Russia had not kept all its agreements made when the U.S.A. resumed diplomatic relations in 1933.

9 **It was announced in Washington** that Sumner Welles, undersec'y of state, was going to Italy, France, Germany and Great Britain for the purpose of advising the president on conditions and that diplomatic conversations were in progress with the neutral nations with a view to the restoration of peace on lasting grounds.

The Irish supreme court ruled as constitutional a law directed against the Irish Republican army, permitting the internment without trial of Irish citizens engaged in subversive activities.

10 **The pope,** in a congratulatory telegram to the Japanese emperor on the 2,600th anniversary of the founding of the empire, expressed the hope that Japan might end the war in which it was engaged.

Pres. Roosevelt warned American Youth congress against affiliation with organizations hostile to American system of government and said that 98% of the Americans were in sympathy with the Finns in their resistance to the Russian invasion.

French chamber of deputies, after discussing in secret for two days the war policy of the gov't, gave Premier Edouard Daladier a unanimous vote of confidence.

11 **When the convention** of the American Youth congress refused to expel communist members the formation of a new youth organization composed of associations with 2,000,000 members opposed to communism was announced.

12 **30,000 troops** from Australia and New Zealand landed at Suez, bringing to 570,000 the number of British and French troops in the near east.

Because conviction was obtained on confessions extorted by "third degree," the supreme court reversed the verdict of guilty found against four Negroes by Florida courts.

Announcement was made of the closing of a contract with the Dominican Republic for the settlement in the republic of 100,000 European refugees with guarantees of civil rights to Jews and non-Jews alike.

Germany and Russia entered into a trade agreement for exchange of German machinery and metals and Russian foodstuffs, oil and tobacco.

13 **Northern and central Europe,** from Norway to Hungary, experienced severest cold in 100 years with Baltic sea frozen and ships in the Rhine crushed by ice.

After resisting for 13 days the renewed attempt of the Russians to break through the Mannerheim line, the Finnish high command announced that Finland relied upon the civilized nations to relieve it.

Pres. Karl Ulmanis of Latvia warned the nation that it must be prepared to defend itself against aggression.

14 **Foreign Minister Tanner** of Finland sent notes to all friendly gov'ts charging the Russians with violating all the rules of civilized warfare.

It was formally announced in Berlin that German submarines had "a theoretical right" to torpedo neutral ships en route to enemy ports.

Pres. Roosevelt left Washington for a vacation at sea on board a naval cruiser.

Germany notified the American republics that it could not respect the neutrality of the zone fixed around the American continent.

15 **Japan** called upon Gen. Chiang Kai-shek to surrender since its armies had conquered enough Chinese territory to support the independent gov't which it was trying to set up under Wang Ching-wei.

U.S. sec'y of the treasury reported to congress that 31 agencies of the gov't had lent $24,400,000,000 and that corporations borrowing $1,053,742,488 had defaulted when repayment fell due.

Great Britain offered to use its warships to convoy neutral vessels to protect them from German submarines.

The Netherlands gov't protested to Germany against the sinking by torpedoes of the merchant ship "Burgerdijk" on Feb. 10.

The Bulgarian premier submitted his resignation to King Boris and Bogdan Philoff was directed to form a new cabinet.

Vice-Pres. Garner appointed a committee of five senators to report on excessive expenditures in primary and general elections and on any violations of the law forbidding federal employees to take an active part in political campaigns.

16 **Crew of British destroyer** boarded German prison ship "Altmark" in Norwegian territorial waters and after brief fight rescued 299 British seamen taken from ships sunk by "Graf Spee"; Germany filed sharp protest with Norway, which in turn protested to British gov't.

Great Britain and France, as a war measure, agreed to open their markets for certain goods to each other without restrictions.

18 **Pres. Estigarribia** of Paraguay announced that he had assumed dictatorial powers and that when anarchy was suppressed he would call a convention to draft a new constitution.

19 **British admiralty** announced that the Germans had torpedoed and sunk the destroyer "Daring," with the loss of 148 of the crew.

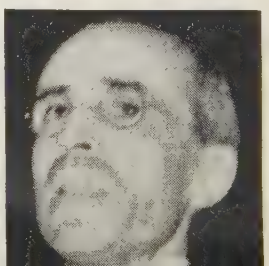
A German decree confiscating all factories, farms and forest lands in Polish territory incorporated in the reich went into effect.

King Gustavus V said Sweden could not send its army into Finland, as active military intervention would mean war with Russia and involvement in war with other powers; the gov't announced that all appeals for aid from Finland would be met short of sending a military force.

20 **French chamber of deputies** expelled 60 communist members who had not renounced connection with the outlawed Communist party.

The pictures on this page are, left to right:

HULL ..... Jan. 2
STANLEY ..... Jan. 5
YONAI ..... Jan. 14
WELLES ..... Feb. 9
POPE PIUS XII ..... Feb. 10



FEBRUARY—*Continued*

21 **Capture** of town and fortress of Koivisto claimed by Russians in 21st day of assault on Mannerheim line.

22 **Sweden demanded** from Russia full reparation for the bombing of the Swedish village of Pajala Feb. 21.

Lingerh Lamutanchu, six-year-old Chinese boy, was enthroned in Lhasa, Tibet, as the 14th dalai lama.

British troops were active in the Northwest Frontier province of India putting down an uprising of tribesmen.

French chamber of deputies, after it was told that France and Great Britain were the only countries which had given material aid to Finland, voted unanimously to fix a day for Finnish relief.

Two bomb explosions in London charged to the Irish Republican army injured 28.

Eight Americans captured by General Franco's forces during the war in Spain were released and allowed to return to the U.S.A.

23 **A British-French squadron of warships** began blockade of the north coast of Norway, Sweden and Russia.

British and French purchasing commissions announced they were prepared to spend $1,000,000,000 in the U.S.A. for aircraft.

Canadian Communications board forbade shipment of freight by truck between Montreal and New York as "long distance transportation should be left to the railways."

24 **The Supreme Defence council** of Turkey declared a state of emergency throughout the republic.

Prime Minister Chamberlain, speaking in Birmingham, said that the British war aims included guaranteed independence of the Poles and the Czechs.

Sweden, which suspended the gold standard Sept. 27, 1931, but made exceptions in favour of foreign exchange, revoked those concessions.

A law suppressing Freemasonry and limiting the activities of other secret societies was approved by the Spanish cabinet.

25 **Great Britain, France, Belgium and Portugal** adopted daylight saving time two months earlier than in 1939.

Foreign ministers of Sweden, Norway and Denmark, meeting in Copenhagen, decided that the three Scandinavian nations would act as a unit in all negotiations with belligerents.

26 **Sumner Welles,** U.S. undersec'y of state, seeking information in Europe, had what was described as a satisfactory interview with Premier Mussolini in Rome.

27 **British admiralty** announced that the battleships "Barham" and "Nelson," about whose fate there had been no public report, were repaired and again in active service.

28 **Securities and Exchange commission,** under authority of the Holding Company act, ordered the unscrambling of the Electric Bond & Share Co. and the Engineers Public Service Co.

British gov't issued orders prohibiting Jews from buying land in one part of Palestine and restricting their purchases in another part.

The sarcophagus of Psusennes I, supposed to be the father-in-law of King Solomon, was opened at San el-Hagar, Egypt, revealing treasures rivalling those found in the tomb of Tutenkhamon.

29 **French cabinet** ordered issuance of food rationing cards.

France reduced gold content of the franc, thus securing paper profit of 30,000,000,000 fr. on gold in the national treasury.

French senate expelled Marcel Cachin, leader of the communists, because he had not renounced his party.

The pictures on this page are, left to right:

GUSTAVUS V	Feb. 19
CHAMBERLAIN	Feb. 24
REYNAUD	Mar. 21
WANG CHING-WEI	Mar. 30
VON RIBBENTROP	Apr. 27

MARCH

1 **Prohibition against** the practice of their professions by Jews in Italy, save to serve their fellow Jews, went into effect.

Congress increased the capital of the Export-Import bank by $100,000,000 to enable it to make loans to friendly countries to buy non-military supplies; loans of $20,000,000 to Finland, $15,000,000 to Sweden and $10,000,000 to Norway were authorized by the Federal Loan administrator.

2 **Pres. Roosevelt** announced that the 21 American republics were agreed to a joint defence of the Panama canal in case of war.

Of three German merchant ships trying to run the British blockade of the island of Aruba in the Dutch West Indies, one was sunk, another captured and the third driven back to port.

3 **Germany apologized** to Belgium for an attack on Belgian aeroplanes over Belgian territory by German planes.

Undersec'y of State Welles left Berlin after interviews with Foreign Minister von Ribbentrop, Chancellor Hitler, Field Marshal Goering and Rudolf Hess, head of the nazi party.

Rumania reduced the gold value of the leu by 50%.

4 **Archduke Otto,** pretender to the throne of Austria, arrived in the U.S.A. "to study the American system as a possible model for a federation of central European states."

Pres. Roosevelt signed the act extending for four years the farm mortgage moratorium.

5 **In spite of a vigorous Italian protest** against interference with the shipment of coal from Germany to Italy, Allied blockading ships seized several coal-laden Italian vessels.

Pres. Roosevelt signed the act setting aside the Kings canyon region of 454,000 ac. in California as a national park.

Rumania by decree set up a national planned economic system.

The U.S.A. sold to Brazil ninety 6-in. guns from its stock of World War (1914–18) munitions.

6 **20 British soldiers** were killed and 16 taken prisoners in the Mersig sector of the French frontier in what was described as the first British-German infantry engagement of the war.

7 **At the opening** of the Rumanian parliament King Carol announced that with 1,600,000 men under arms all the resources of the country would be used to maintain the nation's boundaries.

The Federal Loan administration authorized loans of $20,000,000 to China, $10,000,000 to Denmark and $1,000,000 to Iceland.

France summoned to the colours all naturalized Frenchmen in the U.S.A. under the law of 1927 which forbade a Frenchman to change his nationality without the consent of the department of justice.

The unfinished 85,000-ton British passenger ship "Queen Elizabeth" arrived in New York.

8 **Spokesman** for Japanese foreign office described American loan of $20,000,000 to China as an unfriendly act.

Pres. Roosevelt in a radio address to the farmers said that the reciprocal trade agreements were an essential part of the program to benefit agriculture.

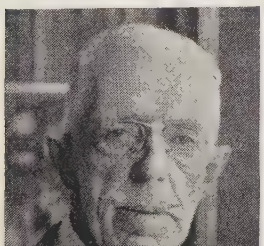
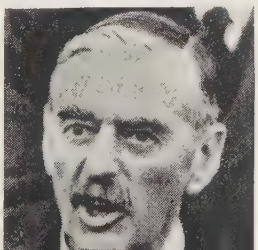
9 **Great Britain** released seized Italian coal ships with their cargoes on the promise of Italy not to send any more ships to Germany for coal.

10 **Undersec'y of State Welles** left Paris after having interviews with the president of France, the premier and several other important officials.

11 **Prime Minister Chamberlain** announced that, if they were asked, Great Britain and France would proceed immediately to help Finland with all their available resources.

Foreign Minister von Ribbentrop of Germany interviewed Pope Pius XII following talk with Mussolini March 10.

12 **Premier Daladier** told the chamber of deputies that 50,000 French soldiers had long been ready to go to the help of Finland if latter nation asked for them.

MARCH—*Continued*

Great Britain floated the first large war loan of £300,000,000.

A treaty of peace between Russia and Finland was signed in Moscow under which Finland ceded to Russia Viipuri (Viborg), all the territory around Lake Ladoga and leased the Hango and Ribachi peninsulas.

13 Italian undersec'y of war told fascist chamber that, with 1,000,000 men under arms, Italy was prepared to defend its liberty of action.

14 Finnish foreign minister in radio address said that Norway and Sweden had denied a formal request from Great Britain and France to permit troops to cross Scandinavian territory for the relief of Finland.

Undersec'y of State Welles, who arrived in London on March 10 and interviewed the king, the prime minister and other important public men, left for Rome on his way home.

15 Finnish diet ratified the peace treaty with Russia by a vote of 145 to 3.

Finnish foreign sec'y in a radio address said that 450,000 of the 500,000 Finns living in the territory ceded to Russia were abandoning their homes and moving into Finnish territory.

16 Pres. Roosevelt said peace must free small nations of economic domination and fear of invasion, abolish large armies, permit free international exchange of ideas and worship of God.

18 Chancellor Hitler of Germany and Premier Mussolini of Italy conferred for more than two hours at Brennero in Brenner pass.

19 Rioting in Lahore, India, by Moslems protesting against an order restricting the carrying of weapons resulted in the death of 29 and serious injury to 39 others.

It was announced in Moscow that the formation of a defensive alliance by Norway, Sweden and Finland would be regarded as an unfriendly act.

Prime Minister Chamberlain told the British house of commons that help to Finland was not sent through Norway and Sweden because Germany had warned those countries against permitting it.

James H. R. Cromwell, U.S. minister to Canada, defended himself for saying ten days previously that the British and French were fighting for the preservation of individual liberty and freedom.

20 French chamber of deputies refused to give a vote of confidence to Premier Daladier and he and his cabinet presented their resignations to Pres. Lebrun.

Undersec'y of State Sumner Welles sailed for home from Italy with his report to the president on the state of affairs in Europe; he announced that he had presented no plans for peace and had received none.

Praesidium of the supreme soviet in Moscow ratified peace treaty with the Finns.

All-India Nationalist congress, in session in Ramgarh, adjourned after authorizing Mohandas K. Gandhi to direct the program for national independence.

21 Sec'y of State Cordell Hull reprimanded Cromwell, U.S. minister to Canada, for his unneutral speech in Toronto and told him not to do it again.

Paul Reynaud succeeded Edouard Daladier as premier of France and formed a cabinet in which M. Daladier was minister of defence and war.

24 An electrical disturbance supposedly caused by sunspots interrupted telephone and wireless communication for several hours.

26 Pres.-elect Guardia of Costa Rica, in the U.S. on a good-will mission, was entertained in Washington by Pres. Roosevelt.

It was announced in Mexico City that by presidential decree of Feb. 28, 1,500,000 ac. of land held by three American corporations had been expropriated.

Prime Minister Mackenzie King won a decisive victory in the Canadian election fought on the issue of his conduct of the war.

27 Russia recalled her ambassador from France as the French gov't had charged him with criticizing its policy.

28 Undersec'y of State Sumner Welles returned from Europe and made a report to the president in Washington.

The supreme war council of the Allies met in London and resolved that neither France nor Great Britain would make a separate peace; they also agreed to continue the alliance as long as it was necessary to safeguard their security and bring about reconstruction.

Pres. Roosevelt signed bill increasing from two to ten years' imprisonment the maximum penalty for espionage against the U.S.A.

29 A German *White Book* issued in Berlin disclosed what purported to be documentary evidence found in Warsaw that American ambassadors in Europe told the Polish ambassador to the U.S.A. that the latter would ultimately join the Allies in the war; the authenticity of the documents was denied in Washington.

Premier-Foreign Sec'y Molotov, in an address to the supreme soviet, said that Russia was determined to remain neutral.

30 A spokesman for the Polish gov't in exile in Angers, France, denounced the German *White Book* as fraudulent, saying that all important diplomatic papers had been removed from Warsaw in the first week of the German invasion.

Wang Ching-wei, premier of China under Sun Yat-sen, set up a puppet gov't in Nanking under the protection of the Japanese army and called on the soldiers of Chiang Kai-shek to lay down their arms.

Majority report of the congressional committee investigating the National Labor Relations board asserted that amendment of the law was imperative to correct "wrongs that are being perpetrated upon industry, labour and the general public."

Ten members of the Ku Klux Klan in Georgia, indicted for kidnapping and whipping victims, were arrested and held for trial.

A New York court, on the appeal of a taxpayer, ordered the board of higher education to revoke the appointment of Bertrand Russell to a professorship in the College of the City of New York because of his "immoral and salacious attitude toward sex."

31 President of the All-India Moslem league proposed the separation of the Moslem and Hindu states into independent federations.

APRIL

1 New Zealand's pension plan, providing at the start $60 a year for all persons 65 years old or over, went into effect.

Brazil resumed payments on its foreign debt after a suspension of five years.

2 Enumeration of the population for the decennial U.S. census began.

Pres. Roosevelt reported to congress that he had ordered the consolidation of bureaus in the treasury and agricultural departments, and the transfer of the bureau of fisheries and the bureau of biological survey to the department of the interior.

3 The earl of Athlone was appointed governor general of Canada to succeed the late Lord Tweedsmuir.

Russian parliament approved a defence budget for the year of 56,000,000,000 rubles.

36 expelled communist members of the French chamber of deputies were convicted by a military court of spreading treasonable propaganda and sentenced to imprisonment for five years.

Attorney-general of Ontario said that Canada should do all in its power to bring the U.S.A. into the war.

7 U.S. Socialist national convention, meeting in Washington, nominated Norman Thomas of New York for president and Maynard C. Krueger of Illinois for vice-president.

8 Great Britain and France planted mines in Norwegian territorial waters to prevent the free movement of German freight ships.

9 German troops entered Denmark and Norway professedly to protect those countries from France and Great Britain and announced that resistance "would be broken by all means." Norway declared war on Germany and moved the capital from Oslo after the Germans had seized the city; British fleet fought Germans off the coast of Norway and Norwegian army resisted nazi advance on land.

Sec'y of State Hull published the note presented to the Mexican ambassador April 3, proposing that all outstanding disputes between the two countries be settled by arbitration.

10 Pres. Roosevelt ordered the extension of the area from which American shipping must remain, save under special rules, to include the sea around Norway as far north as Spitzbergen.

12 Pres. Roosevelt signed the bill extending to June 12, 1943, the authority of the sec'y of state to negotiate reciprocal trade treaties with other nations.

13 German commander in Norway called on Norwegians to submit under penalty of death.

APRIL—*Continued*

Pres. Roosevelt, alluding to the invasion of Norway and Denmark, said that if civilization is to survive, the freedom of small nations must be maintained.

A federal court, sitting in New York, found the president of the International Fur Workers union and ten others guilty of violation of the anti-trust law for using terrorism in an attempt to control the fur industry.

15 **Pres. Roosevelt,** addressing the Pan-American union, said that the peace of the western hemisphere could be preserved "only if we are prepared to meet force with force if challenge is ever made."

16 **Ernest Repp** of the Berlin propaganda bureau was installed in the German embassy in Washington.

17 **Adm. Stark,** chief of naval operations, told the senate naval affairs committee that the U.S.A. should have the most powerful navy in the world.

Sec'y of State Hull announced that any forceful alteration of the status quo of the Netherlands Indies would be prejudicial to the security of the entire Pacific region.

18 **A spokesman** for Japan said that that country was in agreement with Sec'y of State Hull's statement regarding the Netherlands Indies.

A committee of the All-India Nationalist congress called on the people to prepare to pursue a policy of civil disobedience in protest against British control.

The house of representatives, by a vote of 279 to 97, passed a bill permitting appeal to the courts from decisions of executive boards and commissions.

19 **The Netherlands premier** announced that a state of siege had been ordered throughout the country.

Germany ordered the Norwegian minister and his staff to leave Berlin within 24 hours.

Discovery of a plot to turn the gov't of Yugoslavia over to the nazis was announced in Belgrade.

20 **Pres. Roosevelt** declared that the Democratic party could win in Nov. 1940 only by nominating "a liberal pair of candidates."

22 **Anti-picketing laws** of Alabama and California invalidated by U.S. supreme court on the ground that they interfered with freedom of speech and press.

23 **Sir John Simon,** British chancellor of the exchequer, submitted to parliament a budget of £2,667,000,000.

24 **Josef Terboven** named administrator of German-held areas in Norway; nazis continued advances north of Oslo and Trondhjem.

25 **First general conference** of the united Methodist Protestant and Methodist Episcopal churches met in Atlantic City, N.J.

U.S. neutrality laws were applied to Norway by presidential proclamation.

26 **British** admitted Germans had "taken the first trick" in Norway; nazis captured Röros.

27 **Foreign Minister von Ribbentrop** exhibited what purported to be documentary evidence that the British planned the invasion of Norway and had troops on the way with Norwegian consent before the reich acted; Sir Samuel Hoare characterized the charge as a "despicable lie"; the Norwegian ambassador in Washington said that the charge was "absolutely without foundation."

28 **U.S. Socialist Labor party** nominated John W. Aiken of Massachusetts for president and Aaron M. Orange of New York for vice-president.

C. J. Hambro, president of the Norwegian parliament, said there was "irrefutable proof that Germany prepared detailed plans for the invasion of Norway months before it actually occurred."

29 **U.S. supreme court,** by a decision of 8 to 1, sustained the authority of the department of labour, under the Walsh-Healey law, to fix minimum wages for workers on gov't contracts.

30 **Samuel Harden Church,** on behalf of a group of Pittsburgh capitalists, offered a reward of $1,000,000 to anyone who would capture Adolf Hitler during the month of May and deliver him to the League of Nations for trial.

Great Britain ordered all British merchant shipping to keep out of the Mediterranean because of "pronouncements by Italians in responsible positions and the attitude of the Italian press."

Capture of Dombas and Stören announced by Germans; Chancellor Hitler, in an order of the day, announced to the army, "You have fulfilled the tremendous task which I . . . was forced to set for you."

The severest military disaster to civilians in England since the war began was suffered at Clacton-on-Sea when a German bombing plane fell in the main street of the village and exploded, killing 6, injuring 156 others and wrecking 100 houses.

MAY

1 **All belligerents** had assured the Vatican that they would not bomb Rome lest they destroy property of the church, according to a dispatch from Rome.

2 **Prime Minister Chamberlain** told the British house of commons that all British forces had withdrawn from Norway south of Trondhjem; he claimed destruction of the greater part of the German navy and announced heavier concentration of British warships in the Mediterranean.

U.S. congress overrode the president's veto of a bill voting special payments to a group of veterans of the war in the Philippines.

3 **Pres. Roosevelt,** in answer to questions about an interview between Ambassador Phillips and Mussolini in Rome May 1, said the U.S.A. was striving to prevent the spread of war to new areas.

Official soviet news agency announced that both Russia and Germany were interested in preserving the neutrality of Sweden.

Norwegian commander in Trondhjem sector asked Germans for armistice after revealing Allied evacuation of Namsos on night of May 2.

4 **Mexican reply** to Sec'y of State Hull's proposal for arbitration of dispute over expropriation of American-owned oil lands asserted that the issue was domestic and in process of settlement.

6 **Pres. Roosevelt** vetoed bill extending crop insurance to cotton.

U.S. supreme court, reversing decision of lower courts, found 12 oil companies guilty of violating the anti-trust laws by regulating prices and production.

7 **American Pacific fleet** ordered to remain in Hawaiian waters indefinitely.

Prime Minister Chamberlain, after defending himself from severe criticism because of the failure of the Norwegian campaign, announced that Winston Churchill had been put in charge of operations of the British forces.

8 **Chamberlain** was sustained by a test vote of 281 to 200 in the house of commons.

9 **Soviet diplomats** in Sofia, Bulgaria, declared that Russia had informed England, France, Germany and Italy that it did not wish to see any "military adventures" in the Balkans.

10 **German forces** during the night invaded Belgium, Holland and Luxembourg without warning; Hitler announced that the action had been taken to protect these countries from the French and British; Holland and Belgium immediately declared war on Germany and called on the French and British for help.

The British landed troops in Iceland.

Chamberlain resigned as British prime minister and Winston Churchill was commissioned as his successor.

Pres. Roosevelt, denouncing the invasion of Holland and Belgium, said: "I believe that by overwhelming majorities . . . you and I . . . will act together to protect, to defend by every means . . . our science, our culture, our American freedom and our civilization."

American Red Cross appealed for $10,000,000 for the relief of European war sufferers.

U.S. prohibition party nominated Roger W. Babson of Massachusetts for president and Edgar V. Moorman of Illinois for vice-president.

11 **Fort Eben Emael,** strongest link in Belgian defences around Liége, fell to Germans in surprise attack.

Pres. Roosevelt ordered the application to Belgium, Holland and Luxembourg of all provisions of the neutrality law.

Allied troops landed on Dutch islands in the West Indies.

12 **German troops** advanced beyond Liége, after crossing the Albert canal, and occupied most of northern Holland.

13 **Moerdijk bridge** south of Rotterdam seized by Germans, who thus cut the Netherlands in two; Queen Wilhelmina and her family fled to England.

French city of Sedan captured by nazis after rapid thrust through Ardennes.

Prime Minister Churchill received a unanimous vote of confidence from the British parliament.

14 **Dutch army** surrendered to the Germans, except in Zeeland; Gen. Winkelman, commander-in-chief, appealed to all citizens to maintain order.

MAY—*Continued*

Rear Adm. Richard E. Byrd arrived in New York city from the antarctic and reported that his expedition had charted 900 mi. of formerly unknown coast.

Gen. John J. Pershing said that the U.S.A. "must be prepared for whatever instant action is required for our security."

15 The Allies claimed they had successfully met a German attack along a 60-mi. front from Namur to the Sedan "bulge" in France.

Foreign Minister van Kleffens of the Netherlands reported that 100,000 men, or one-fourth of the nation's army, had been killed in battle.

Herbert C. Hoover accepted chairmanship of Belgian relief commission.

16 Gov't of Paris transferred to military authority.

Pres. Roosevelt asked congress for an appropriation of $1,182,000,000 for national defence and announced that the army and navy should be equipped with 50,000 planes.

17 Fall of Brussels, Namur and Louvain announced in Berlin; German troops widened gap in French defences around Sedan and at other points farther north along border; Gen. Gamelin, commander of the French armies, ordered the various units to fight to the death rather than retreat.

Pres. Roosevelt ordered the recommissioning of 35 more destroyers laid up since the World War of 1914–18.

Col. Frank Knox of Chicago, with the approval of the president, began plans for training at private expense of 10,000 college students as air pilots.

18 Antwerp captured by German troops; nazis in northern France drove westward toward English channel.

Mexico paid $1,000,000 to the Sinclair oil interests as the first instalment on $8,500,000 to be paid for expropriated oil lands.

19 Gen. Maxime Weygand was appointed commander-in-chief of the Allied armies to succeed Gen. Gamelin.

German gov't, in an order dated May 18, proclaimed reincorporation into the reich of Eupen, Malmédy and Moresnet, which had been ceded to Belgium by the Versailles treaty.

20 U.S. supreme court, in a unanimous decision, declared unconstitutional the Connecticut law which prohibited soliciting funds for religious purposes without a permit; the court, by an 8 to 1 decision, sustained the constitutionality of the bituminous coal act.

21 The administration asked U.S. congress to authorize creation of a naval air force of 10,000 planes with 15,000 pilots.

The Germans forced their way to Abbeville at the mouth of the Somme river on the English channel after occupying Amiens and Arras.

Pres. Roosevelt vetoed a river and harbour bill appropriating $109,985,450, on the ground that non-military expenses should give way to preparation for national defence.

Premier Reynaud told the French senate that the setback which France had experienced in the war was due to its failure to understand changes in methods of warfare.

Canadian house of commons voted a war budget of $700,000,000.

22 British parliament authorized the gov't to take control of all industry, all property and all labour, as needed to win the war.

Pres. Roosevelt ordered transfer of the immigration and naturalization functions of the department of labour to the department of justice.

The Military Training Camps association, which organized the Plattsburg training camp in the World War of 1914–18, adopted a resolution urging immediate compulsory military training in the U.S.A.

23 The Germans advanced to Boulogne on the English channel and strengthened ring around the trapped Allied armies in Flanders.

Sir Oswald Mosley, leader of British fascists, interned in London.

24 Nazi troops reached Calais and fought to take the city.

King George VI, in a radio address to the British empire, said: "Defeat . . . will mean destruction of our world as we have known it and the descent of darkness upon its ruins."

Pres. Roosevelt, referring to rumours about a coalition cabinet including prominent Republicans, said that such a plan had never been contemplated.

25 Gen. Weygand dismissed 15 general officers of the French army.

26 Gen. Sir Edmund Ironside was made commander-in-chief of the home forces and was succeeded as British chief-of-staff by Gen. Sir John Dill.

Pres. Roosevelt, in a radio address, said that the U.S. army and navy were stronger than at any time since the World War of 1914–18 and that if private industry needed capital for manufacture of war material it would be supplied by the gov't.

27 Jay Pierrepont Moffat, chief of the European division in the state department, was appointed U.S. minister to Canada.

U.S. supreme court decided that the Apex Hosiery company of Philadelphia could not collect triple damages under the anti-trust law from the American Federation of Full-Fashioned Hosiery Workers for destruction of property during a sit-down strike.

League of Red Cross Societies in Geneva reported that 5,000,000 refugees from Belgium, Holland, Luxembourg and northern France were in flight before the German armies.

28 King Leopold of Belgium surrendered his army to the Germans unconditionally over the protests of his cabinet and of the French command; Belgian Premier Pierlot declared the action "unconstitutional."

American Red Cross raised its war relief quota to $20,000,000.

General assembly of the U.S. Presbyterian Church adopted a resolution asking the president to recall Myron C. Taylor as emissary to the Vatican.

Allies captured Narvik and two adjoining towns in Norway.

Council of National Defense established by Pres. Roosevelt to include seven civilians; Edward R. Stettinius, Jr., named to supervise supply of raw materials and William S. Knudsen to co-ordinate industry.

29 Lille fell before German advance; Allies, fighting to escape from Flanders pocket, flooded Yser valley region and continued evacuation of troops from Dunkirk.

Italian ministry of foreign exchange cancelled permits to import goods except by barter, and prohibited acquiring of foreign exchange.

Sir Kingsley Wood, new British chancellor of the exchequer, announced that a 100% tax would be levied on all profits above a fixed rate.

30 Arthur Seyss-Inquart took office as civil administrator of the Netherlands; he explained that the country had been occupied as a military necessity, "not as conquerors seeking to impose our political ideas."

Wilbur Shaw of Indianapolis won the 500-mi. automobile race on the Indianapolis speedway for the third time.

U.S. state department announced conversations with Ecuador with a view to persuading that country to end the operation of its passenger air lines by Germans.

Reports from Rome indicated that Italy had between 1,500,000 and 1,800,000 men under arms.

Canadian Police arrested heads of the National Unity party, a fascist organization.

U.S. house of representatives agreed to the senate proposal for beginning work immediately on a third set of locks in the Panama canal.

31 Pres. Roosevelt told congress that the recent extensive use of tanks and planes in war made it imperative that at

The pictures on this page are, left to right:

CHURCHILL ..... May 10
WILHELMINA ..... May 13
GAMELIN ..... May 17
WEYGAND ..... May 19
IRONSIDE ..... May 26

MAY—*Continued*

least $1,000,000,000 more should be spent for U.S. national defence; he asked authority to call out the national guard and all reserve forces if necessary.

London announced that three-fourths of the British expeditionary force in Flanders had been safely evacuated from Dunkirk.

JUNE

1 **The 35,000-ton U.S. battleship** "Washington" was launched at the Philadelphia navy yard.

German planes raided southern France for the first time, dropping bombs in the Rhone valley and on the port of Marseilles.

Ion Gigurtu, a pro-German, was named foreign minister of Rumania.

2 **The Germans** continued their air raids in the south of France for the purpose, in French opinion, of influencing Italian decision regarding entry into the war.

U.S. liner "Manhattan" sailed from Genoa with 1,964 American refugees on board; "President Roosevelt" sailed from Galway with 720.

National convention of the U.S. Communist party at New York city nominated Earl Browder of Kansas for president and James W. Ford of New York, a Negro, for vice-president.

Portugal began a six-month celebration of the 800th anniversary of its founding and the 300th anniversary of the recovery of its independence.

3 **Resolutions** were introduced in both houses of U.S. congress declaring that the U.S.A. would not acquiesce in the transfer of any geographical region in the western hemisphere from one non-American power to another.

National conference of governors, in session at Duluth, Minn., voted that all necessary steps should be taken to provide adequately for national defence and pledged each state to cooperate toward that end.

German planes dropped more than 1,000 bombs on Paris, killing 254 persons and injuring 652; French planes in retaliation bombed German cities.

Indefinite postponement of international exposition of 1942 in Rome announced by Italian gov't.

Gov. Lehman of New York called out 500 members of the national guard to protect the 74 state armories.

4 **German troops** took possession of Dunkirk after it had been evacuated by the Allies; nazis occupied last of Belgian territory.

Prime Minister Churchill, in describing the evacuation of Dunkirk to the house of commons, said that even if the British had to stand alone against the German military machine, the empire would fight to the bitter end until in "God's good time" the new world came to the rescue of the old.

Sir Stafford Cripps, a left wing labourite, was accepted by the U.S.S.R. as British ambassador to Moscow.

Charles Edison, U.S. sec'y of the navy, resigned to run for governor of New Jersey on the Democratic ticket.

5 **The Germans** began an attack upon the French on a battle line extending 120 mi. east from Abbeville on the English channel with a reported force of 1,000,000 men, 1,000 bombing planes, 2,250 tanks and 15,000 motor vehicles.

Premier Reynaud of France re-made his cabinet, dropping former Premier Daladier as minister of foreign affairs and assuming that post himself.

International Ladies' Garment Workers union resumed its affiliation with the American Federation of Labor.

Federal Communications commission forbade amateur radio operators to communicate in any way with foreign stations.

6 **U.S. state department** ordered that, beginning July 1, all visitors to the U.S.A. from Canada, Mexico, Cuba and several other American countries should have passports.

U.S. navy department announced it would return 50 planes to their manufacturer, to be replaced by new ones with the understanding that the manufacturer would sell the old planes to the Allies.

Naval appropriation bill calling for $1,492,000,000 was sent to the president for his approval.

French army communiqué claimed wholesale destruction of German tanks but conceded enemy advances below Abbeville and Laon.

7 **Italian merchant ships** at sea were ordered to take refuge in the nearest neutral port.

8 **French army's left wing** retreated along line extending from Neufchâtel to vicinity of Soissons.

9 **The French** battle line was extended to the Swiss frontier, with approximately 2,000,000 Germans engaged; nazis reached outskirts of Rouen.

Lawson Little won U.S. open golf championship at Cleveland, O., defeating Gene Sarazen.

10 **Premier Mussolini** declared war against France and England; he exempted Turkey, Switzerland, Yugoslavia, Greece and Egypt from military designs.

King Haakon of Norway ordered that resistance to the Germans should end following the withdrawal of French and British troops from Narvik; he and his gov't went to England.

Pres. Roosevelt, referring in an address at the University of Virginia to the Italian declaration of war, said "the hand that held the dagger had plunged it into the back of its neighbour," and pledged the U.S.A. to give all possible material assistance to the Allies.

French gov't moved from Paris to Tours and other towns in the Loire valley.

Sinking of the British aircraft carrier "Glorious" during evacuation of Narvik announced in London.

Uruguayan minister of defence revealed precautions to check a suspected German plot to seize the gov't.

11 **Pres. Roosevelt,** by proclamation, extended the neutrality act to relations with Italy.

Princess Juliana of the Netherlands and her two young daughters arrived in Halifax, N.S.

Italian planes bombed Malta and Aden; British bombed Italian bases in Libya and Eritrea.

Turkey summoned 200,000 additional men to arms, making a total of 550,000 ready for war.

Pres. Vargas of Brazil announced his country's neutrality and said that "vigorous peoples fit for life must follow the route of their aspirations."

Pres. Roosevelt asked congress for $50,000,000 for American Red Cross relief work.

12 **Chung King,** provincial capital of China, suffered the severest bombing since May 1939; 127 planes dropped explosives on the city and destroyed the homes of 150,000 persons.

One hour after Pres. Roosevelt signed the naval appropriation bill of $1,308,171,000, the navy department completed contracts for 22 new warships, including two battleships of 45,000 tons each.

80 bombing planes were released by the U.S. gov't for sale to the Allies.

As Uruguay was about to bring criminal suits against the leaders of German organizations the German minister in Montevideo announced that the nazi party and the German labour front in Uruguay had been dissolved.

British planes bombed Turin and Genoa.

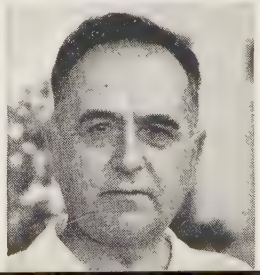
Egypt, pledging loyalty to the Allies, broke off diplomatic relations with Italy; the Allies concentrated battleships at the northern end of the Suez canal to prevent Italy from reaching its east African possessions.

13 **Paris** was declared an open city in order to prevent its destruction by the Germans.

Premier Reynaud, in a message to Pres. Roosevelt, asked for "clouds of planes from across the Atlantic" to ward off French defeat.

The pictures on this page are, left to right:

LEOPOLD III	May 28
MUSSOLINI	June 10
VARGAS	June 11
WOODRING	June 20
KNOX	June 20



JUNE—*Continued*

Japanese-controlled Chinese gov't demanded that all armed forces of European belligerents withdraw from China.

The 35,000-ton U.S. battleship "North Carolina" was launched at the Brooklyn navy yard.

Turkey signed a trade agreement with Germany.

Mexican gov't demanded that Arthur Dietrich, press attaché of the German legation, leave the country because of his propaganda activities.

14 **Paris was occupied** by German troops; nazis opened attack on northern flank of Maginot line; Le Havre fell.

Spanish troops occupied international zone of Tangier.

French gov't moved from Tours to Bordeaux.

Chancellor Hitler ordered a three-day holiday in Germany in celebration of the capture of Paris.

Congress adopted a resolution permitting Finland to postpone payments on its debt due June 15 and Dec. 15, 1940.

15 **The Germans** outflanked the Maginot line after taking Verdun as the French moved their troops from the fortifications.

Finland paid $159,398 on its war debt to the U.S.A., the amount due; Rumania paid $100,000, the first payment since 1932; Hungary paid $9,828.

Pres. Roosevelt, replying to Premier Reynaud's plea for "clouds of planes," said that the U.S.A. would do all in its power to help the Allies and would not recognize any infringement on the territorial integrity of France.

Col. Charles A. Lindbergh warned against "minority efforts" to involve the U.S.A. in war, insisted that the U.S.A. was unprepared and urged that national defences be strengthened.

Russian troops moved into Lithuania and took possession of the country.

16 **Premier Reynaud** resigned; Marshal Henri Philippe Pétain succeeded him and reorganized the cabinet with Camille Chautemps as vice-premier and Gen. Weygand as minister of defence.

Sen. Key Pittman (Dem., Nev.) criticized Col. Lindbergh for his speech of June 15 and charged him with trying to destroy confidence in the national administration.

While the French were considering surrender, Prime Minister Churchill proposed to them a Franco-British federation; the plan was rejected by Pétain's gov't.

17 **France sued for** "an honourable peace."

Bills were introduced in U.S. congress providing for construction of 84 warships within four years at a cost of $1,200,000,000.

Russia followed its occupation of Lithuania by sending armed forces into Latvia and Estonia.

18 **Hitler and Mussolini** met in Munich to draft the terms on which they were willing to end the war with France.

Prime Minister Churchill told the house of commons that Great Britain had not released France from its agreement not to sign a separate peace.

German planes, in the first concerted attack on Britain, raided the eastern coast of England.

Germans took Cherbourg on the French coast; French admitted capture of Orleans.

19 **The earl of Athlone,** new governor general of Canada, arrived at Halifax, N.S.

The U.S.A. notified Germany, Italy, France, Great Britain and Holland that it "would not acquiesce . . . in any attempt to transfer any geographic region of the western hemisphere from one non-American power to another non-American power."

German minister in Montevideo protested against what he called the unfriendly attitude of the Uruguayan gov't in its campaign against German "fifth column" activities.

Pres. Roosevelt commissioned Sidney Hillman to study his proposal to give 2,000,000 American youths some form of compulsory semimilitary training every year.

20 **Harry H. Woodring,** U.S. sec'y of war, resigned; Henry L. Stimson of New York nominated as sec'y of war and Frank Knox of Illinois as sec'y of the navy.

France asked Italy for an armistice.

Pres. Roosevelt approved plans for putting control of the export trade of the western hemisphere in the hands of an inter-American export corporation and directed the sec'y of state to make the necessary arrangements.

A bill providing for the compulsory registration of all men between the ages of 18 and 65 for selective military training was introduced in the U.S. senate.

Joe Louis successfully defended his title as heavyweight champion by knocking out Arturo Godoy in New York city.

21 **Representatives of Germany,** led by Chancellor Hitler, met French representatives to negotiate terms of peace in the Compiègne forest on the spot where the armistice of 1918 was signed.

King Carol of Rumania organized a single totalitarian "party of the nation" to supersede all other political parties.

22 **Germany and France** signed an armistice in the Forest of Compiègne by which France agreed to surrender all its sea forces and demobilize its land and air forces; terms also provided for nazi occupation of approximately half of France.

U.S. congress passed an act raising the limit of the national debt from $45,000,000,000 to $49,000,000,000 and approved a national defence tax bill to yield $994,300,000 a year.

Sec'y of State Hull announced that 20 Latin-American countries had accepted the invitation of the U.S.A. to attend a conference to consider economic and political problems arising from the European war.

23 **Great Britain** withdrew recognition of the French gov't which accepted the terms of the armistice with Germany.

A French national committee led by Gen. Charles de Gaulle was formed in London to carry on the war with the aid of "free" French forces.

24 **The French** signed an armistice with Italy, and an order to end hostilities was issued.

Hitler ordered that Germany's victory over France should be celebrated in the reich by a display of flags for ten days and ringing of bells for seven days.

The French gov't ordered a day of mourning.

Pres. Roosevelt, after receiving a report from the attorney-general that the sale of warships to belligerents was forbidden by law, countermanded an order to turn over to the builders 20 torpedo boats for sale to England.

Nine of 13 defendants accused of plotting to overthrow the gov't of the U.S.A. were acquitted in Brooklyn, N.Y.; a mistrial was ordered in the case of four.

The Republican national convention opened in Philadelphia with Gov. Harold E. Stassen of Minnesota making the keynote speech.

Yugoslavia entered into diplomatic relations with Russia by sending a minister to Moscow.

25 **Fighting** between France and Germany and Italy ceased at 12:35 A.M., French time.

Edouard Herriot, Joseph Paul Boncour and Leon Blum, former French premiers, fled from France and arrived in London.

Negotiations with Henry Ford to build 6,000 aeroplane engines for England were broken off when Mr. Ford announced that he would build no engines for a foreign power.

Plans for training 5,000 young men a year as officers in the U.S. naval reserve were announced by Pres. Roosevelt.

Pres. Roosevelt signed new tax bill which reduced exemption from income taxes for married persons from $2,500 to $2,000 a year and for single persons from $1,000 to $800.

The Germans occupied the whole Atlantic coast of France.

26 **U.S. Export-Import bank** granted a credit of $20,000,000 to Argentina for the purchase of construction materials in the U.S.A.

The Republican national convention adopted a platform favouring adequate national defence and opposing intervention in the European war.

Russia ordered the substitution of an 8-hr. 6-day week for the 7-hr. 5-day week in order to speed up production of war munitions.

27 **Rumania** yielded to Russia's demand for Bessarabia and northern Bukovina; Russian troops moved into the ceded territory.

Pres. Roosevelt declared the existence of a national emergency to enable the gov't to control American and foreign shipping in U.S. territorial waters and around the Panama canal.

28 **Wendell Lewis Willkie** of New York nominated by Republicans for president and Charles Linza McNary of Oregon for vice-president.

Great Britain recognized the French national committee in London as the leader of all "free" Frenchmen, and as an ally.

29 **When Russian troops moved** from Bessarabia into Moldavia, a part of Rumania not ceded to Russia, King Carol ordered the mobilization of all Rumanian troops.

Pres. Roosevelt signed a bill providing for the registration and finger-printing of all aliens.

JUNE—*Continued*

U.S. war department ordered the creation of a corps of two divisions in the U.S. army to be equipped with 1,400 tanks, 600 pieces of artillery and 13,000 automatic and semi-automatic rifles.

The Germans took possession of Bordeaux; the French gov't moved temporarily to Clermont-Ferrand on June 30.

Hachiro Arita, Japanese foreign minister, announced that Japan favoured uniting all east Asia and the South seas under a single dominating influence.

30 **Russia,** while taking possession of Bessarabia, was reported to have landed small tanks transported by planes.

JULY

1 **German gov't** told diplomatic representatives in Berlin that all foreign diplomats must be withdrawn from Norway, Belgium, Holland and Luxembourg.

Moses L. Annenberg, Philadelphia publisher, was sentenced to three years in prison by a federal court in Chicago after conviction on charges of evading income tax payments.

U.S. navy department awarded contracts for the construction of 44 fighting ships costing $550,000,000 two hours after Pres. Roosevelt signed the bill authorizing the appropriation.

Enactment of a steeply graduated excess profits tax on individuals and corporations recommended to congress by Pres. Roosevelt.

Channel islands of Guernsey and Jersey occupied by Germans after they had been evacuated by the British.

French national committee in London appointed Vice-Adm. Muselier to command the "free" French fleet and the remnants of the French air force.

Rumanian council of ministers renounced the Franco-British guarantee of April 13, 1939, as of no further value.

Pres. Roosevelt signed a bill forbidding sale or transfer of any vessels, weapons or munitions of war to a foreign power without previous certification that they were not essential to national defence.

2 **German casualties** of 27,074 killed in campaigns starting May 10 announced by high command.

British prison ship "Arandora Star," carrying 1,640 interned Germans and Italians to Canada, sunk by a German submarine off coast of Ireland; more than 1,000 of the prisoners drowned.

U.S. treasury department reported that deficit for fiscal year 1940 was $3,612,000,000.

French gov't moved its headquarters to Vichy.

3 **Pres. Ortiz** of Argentina turned over the duties of his office to Vice-Pres. Castillo for an indefinite period.

British seized ships of the French navy in English ports and forbade French ships at Alexandria to leave port; when French ships off Oran, Algeria, rejected the terms offered, the British opened fire and sank or disabled nearly all the fleet.

4 **Library at Hyde Park, N.Y.,** built to hold state papers and other documents of Pres. Roosevelt, was turned over to the national archivist.

American Negro exposition to celebrate the 75th anniversary of Negro emancipation, opened in Chicago.

King Carol of Rumania appointed a pro-German and anti-Jewish cabinet with Ion Gigurtu as premier.

Bomb disguised as a portable radio was found in the British pavilion at the New York World's fair and taken outside where it exploded, killing two policemen and seriously injuring two others.

5 **French foreign minister** announced at Vichy that diplomatic relations with Great Britain had been ended.

German armistice commission, following Britain's attack on French naval units at Oran, released France's sea and air forces from prohibition against engaging in hostilities; French planes bombed Gibraltar.

Pierre Laval named by Pétain gov't to draw up new French constitution.

Germany, replying to Sec'y of State Hull's note of June 18 on the Monroe Doctrine, said that the U.S. note was unjustified and that if the U.S.A. objected to European interference in American affairs it should refrain from interfering in the affairs of Europe.

6 **Chancellor Hitler,** absent from Berlin since May 10, returned to the city and was welcomed with great enthusiasm as he drove over streets covered with flowers.

German military commander in Holland charged that Netherlanders were giving military information to the British and announced that the guilty, if discovered, would be punished with death.

7 **Presidential election** in Mexico was accompanied by series of fatal riots.

8 **King Haakon** of Norway, speaking in London, announced his refusal to abdicate on the demand of the German-controlled Norwegian parliament.

9 **Duke of Windsor** appointed governor of the Bahamas.

Commanders of the French fleet in Alexandria harbour agreed, on the demand of the British, to immobilize their warships.

First large naval engagement in the Mediterranean between British and Italians fought east of Malta; both sides claimed victory.

Joseph W. Martin, Jr., named chairman of the Republican national committee with John D. M. Hamilton, retiring chairman, as his assistant.

Henry L. Stimson confirmed by senate, 56 to 28, as U.S. sec'y of war.

10 **U.S. senate** confirmed nomination of Frank Knox as sec'y of the navy, 66 to 16.

Additional appropriation of $4,848,171,957 for national defence asked by Pres. Roosevelt; he declared that no American soldiers would be sent abroad to take part in any European war.

French national assembly at Vichy gave Premier Pétain authority to promulgate a new constitution fashioned on the fascist model to be submitted to popular vote for ratification.

11 **Sec'y of State Hull** warned Germany against attempts to intimidate delegates to the Pan-American conference in Havana.

Marshal Pétain assumed full legislative and executive powers in France pending ratification of the new constitution.

12 **Mexican Revolutionary party** announced that Manuel Avila Camacho, administration candidate for president, had received 2,136,625 votes and Gen. Almazán, the opposition candidate, 128,574; the figures were disputed by supporters of Almazán.

British recognized Haile Selassie as emperor of Ethiopia and promised to help him in drive against Italians.

13 **Departments of state and justice** interpreted U.S. immigration law to permit an unlimited number of refugee children from Europe to enter the U.S.A. as visitors.

14 **Fulgencio Batista** elected president of Cuba, defeating Ramon Grau San Martin.

15 **Democratic national convention** opened in Chicago with William B. Bankhead of Alabama, speaker of the house of representatives, making the keynote address.

Chilean police announced they had thwarted a fascist-nazi plot to overthrow the gov't.

Italian planes bombed Haifa in first air attack on Palestine; British announced Italian capture of Ft. Moyale on Kenya border.

16 **Spain** broke off diplomatic relations with Chile.

Sen. Barkley (Dem., Ky.), permanent chairman of the Democratic national convention, announced he was authorized to say that Pres. Roosevelt had no desire to be renominated and that the delegates were free to vote for any candidate.

17 **Francisco Franco** served notice on Great Britain that Spain expected to recover control of Gibraltar.

The Democratic convention adopted a platform pledged to national defence and non-intervention in the European war.

18 **Pres. Roosevelt** was nominated by Democratic national convention on first ballot, for a third term, receiving 946 votes out of 1,095½ cast.

19 **Henry A. Wallace** of Iowa, sec'y of agriculture, nominated for vice-president by the Democrats.

Pres. Roosevelt, in a radio address to the Democratic convention, said that he accepted the nomination from a sense of duty to serve the country in a crisis.

Chancellor Hitler, in an address to the reichstag, said that the British had the choice of withdrawing from the war or seeing their empire destroyed.

German officials in the Hague said that reprisals would be taken against distinguished persons in Holland for mistreatment of Germans in the Dutch East Indies.

Postmaster Gen. Farley reelected chairman of the Democratic national committee, to serve until Aug. 17.

20 **Pres. Roosevelt** signed bill appropriating $4,000,000,000 for a two-ocean navy.

JULY—*Continued*

Ambassador William C. Bullitt, on his arrival in New York city from France, said that the new French gov't could not properly be called fascist.

Hatch bill, prohibiting state employees paid in part by federal funds from engaging in political activity, signed by Pres. Roosevelt.

21 Parliaments of Lithuania, Latvia and Estonia, elected July 14, declared their countries part of the soviet union.

Second Pan-American conference of foreign ministers opened in Havana and was welcomed by Pres. Federico Laredo Bru of Cuba.

22 Sec'y of State Hull proposed to the Pan-American conference a collective trusteeship by the 21 American republics over European possessions in the new world, should the occasion arise.

Pres. Roosevelt recommended to congress that $500,000,000 be added to the lending power of the Export-Import bank for additional credits to Latin-American republics.

Viscount Halifax, foreign sec'y, answered Hitler's speech of July 19 by saying that the British would not cease fighting "till freedom for ourselves and others is secure."

Aviators attached to the French army organized in England joined the British in bombing Germany.

Prince Fumimaro Konoye, new Japanese premier, formed a cabinet which he said would enhance the spirit in which the empire was founded.

Canadian department of munitions decided to build 12 munition factories at a cost of $19,000,000.

23 French gov't ordered trial of former Premier Daladier and 22 other former officials on the charge of responsibility for the military catastrophe which had overtaken the country.

Budget calling for £3,467,000,000 was presented to the British parliament with provision for an income tax beginning at 42½% and rising to 90% on large incomes.

Undersec'y Welles of the state department announced that the U.S.A. would continue to recognize the ministers of Lithuania, Latvia and Estonia as envoys of sovereign gov'ts under duress.

Reports that a Russian air base was being developed on Big Diomede island in the Bering sea, a mile from an island owned by the U.S.A., were confirmed.

25 Pres. Roosevelt placed an embargo on the export of scrap metal, petroleum and petroleum products without a special licence.

27 U.S. state department ordered opening of consulate at Georgetown, British Guiana, which had been closed for 20 years.

U.S. Civil Aeronautics board reported that 50,000 students were in training as air pilots.

29 Pres. Roosevelt asked congress for authority to call out the national guard for a year's service.

The 26,454-ton United States Line passenger ship, "America," largest ever built in the country, arrived in New York harbour preparatory to its first commercial voyage.

30 Pan-American conference at Havana adjourned after approving plans for dealing with European possessions in the new world, for combatting "fifth column" activities and for economic co-operation.

Great Britain extended its naval blockade to include all of continental Europe.

British Foreign Sec'y Halifax protested to the Japanese ambassador in London against the wholesale arrest of British citizens in Japan.

31 Embargo on export of U.S. aviation gasoline outside the western hemisphere, except to supply American air lines, proclaimed by Pres. Roosevelt.

French gov't ordered confiscation of the property of all Frenchmen who fled the country and could not give satisfactory reasons for their flight.

Japanese foreign office spokesman said that the British protest against the arrest of British citizens was unreasonable and that Japan would continue to arrest everyone suspected of spying or working against the interests of the country.

Compulsory military service registration bill revised by U.S. senate committee to include men between ages of 21 and 31 only.

AUGUST

1 Edward J. Flynn of New York elected chairman of the Democratic national committee.

Japanese gov't announced its intention to develop Japan as a totalitarian state and to enter on a foreign policy which would extend Japanese domination over China, French Indo-China and the Dutch East Indies.

Premier Molotov, addressing the supreme soviet in Moscow, said that Europe's "imperialist war" might soon involve America; he reaffirmed Russian friendship with Germany.

2 French military court found Gen. Charles de Gaulle, leader of "free Frenchmen" in England, guilty of treason and sentenced him to death.

Prominent Japanese business men in London and other parts of the British empire were arrested.

3 Japanese ambassador in Washington protested against the U.S. embargo on export of aviation gasoline.

4 First passenger plane to cross the Atlantic from England since Oct. 3, 1939, arrived in New York city.

Gen. John J. Pershing, in a radio address, said that the U.S.A. should make available to Great Britain, as a measure of national defence, at least 50 destroyers left over from the World War of 1914–18.

5 More than 300,000 officers and men of the U.S. regular army, the national guard and the organized reserves assembled for war games.

6 The Italians attacked British Somaliland at three points and began a movement to invade Egypt from Libya.

Annual trade agreement between Russia and the U.S.A. renewed.

Camillien Houde, mayor of Montreal, was interned by the Canadian minister of justice because of his appeal to the people to resist enforcement of the mobilization law.

Germany ordered all Jews to leave Cracow within 14 days.

7 U.S. sec'y of war put six U.S. arsenals on an operating program of 24 hours a day, 6 days a week.

8 Representation on the governor general's council and ultimate dominion status was offered to India by the British in an effort to win full co-operation in fighting Germany.

U.S. sec'y of the treasury announced that money in the U.S. belonging to the gov't and citizens of countries invaded by Germany—about $2,000,000,000—would be held until the end of the war for possible use in paying claims of the U.S. and its citizens.

9 Great Britain recalled all troops from Shanghai and northern China.

John Cudahy, U.S. ambassador to Belgium, was rebuked by the department of state and summoned to Washington after reputedly declaring in an interview at London that there would be starvation in Belgium during the winter, that King Leopold was justified in surrendering and that German soldiers in occupied areas were acting better than American soldiers would have acted in similar circumstances.

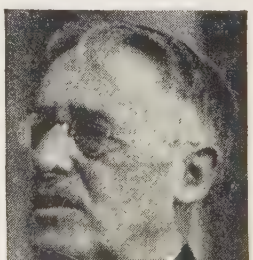
10 The U.S.A. announced it would re-open its consulates in Dakar, French West Africa, and on the French islands of St. Pierre and Miquelon, as "listening posts."

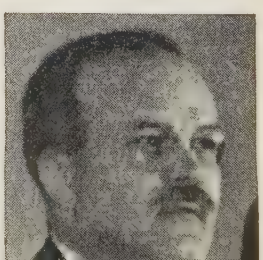
11 What the British regarded as the start of massed attacks took place when the Germans increased the intensity of the bombing of the southeastern coast of England.

12 The soviet gov't demanded that the U.S.A. remove all its diplomatic and consular agents from Lithuania, Latvia and Estonia.

The pictures on this page are, left to right:

MC NARY ..... June 28
HITLER ..... July 6
STIMSON ..... July 9
FRANCO ..... July 17
MOLOTOV ..... Aug. 1





AUGUST—*Continued*

France sent Vicomte Jacques d'Aumale to New York city as a minister plenipotentiary to succeed the retiring consul general there.

13 **Pres. Roosevelt** returned to Washington after a three-day inspection of the progress of defence work in the naval and military establishments of New England.

14 **British** dropped bombs on Milan, Turin, Alessandria, Tortona and Augusta, Italy.

Pres. Roosevelt urged young people of college age to continue their studies instead of abandoning them to work in shipyards or enlist in the armed forces of the country.

King George VI of Great Britain set apart Sept. 8 as a day of prayer for peace.

British admiralty announced that the 16,923-ton armed merchant cruiser "Transylvania" had been sunk by a German submarine with the loss of between 30 and 40 sailors.

15 **Intensity of German raids** on England and Scotland increased when more than 1,000 planes dropped bombs on the country, attacking the London airport for the first time.

Minseito party, largest political organization in Japan, was dissolved in accordance with the governmental plan to recognize only a single party.

U.S. war department awarded contract to the Chrysler corporation for erecting factory and building 1,000 25-ton tanks.

Henry A. Wallace, sec'y of agriculture, resigned to enter the campaign for the vice-presidency on the Democratic ticket.

Negotiations were announced between the U.S.A. and Great Britain for lease by the former of sites for naval and air stations on British islands in the Caribbean sea and along the Atlantic seaboard.

The pictures on this page are, left to right:

PERSHING	Aug. 4
CUDAHY	Aug. 9
BULLITT	Aug. 18
WICKARD	Aug. 19
MARSHALL	Aug. 20

16 **Metropolitan London** bombed heavily; casualties were undisclosed.

17 **Germany** proclaimed a complete blockade of the British isles, covering an area of about 1,000 mi. square.

Rumania agreed to cede to Bulgaria all of southern Dobruja.

Wendell L. Willkie accepted the Republican presidential nomination in a speech at Elwood, Ind., in which he challenged Pres. Roosevelt to a joint debate on domestic issues.

18 **William C. Bullitt,** U.S. ambassador to France, said in an address in Philadelphia, Pa., that the U.S.A. was in as great danger as France was in the summer of 1939; he warned against delays in preparedness and urged all possible help to Britain.

After a conference with Prime Minister Mackenzie King of Canada in northern New York, Pres. Roosevelt announced that a permanent joint board of defence for the two countries would be established.

19 **Rumania** indicated its willingness to cede to Hungary about one-fifth of the territory in Transylvania demanded by the latter.

Law promulgated in France prohibited foreigners to practise medicine, dentistry or pharmacy without special permission.

British withdrew their forces from Somaliland and abandoned attempt to defend it against the Italians.

Claude R. Wickard of Indiana, undersec'y of agriculture, nominated sec'y of agriculture by Pres. Roosevelt.

20 **Prime Minister Churchill** told parliament that Great Britain would place defence facilities of its transatlantic possessions at the disposal of the U.S.A.; he also announced there would be no relaxation of the British blockade to permit food to reach continental Europe.

Gen. Marshall, U.S. chief of staff, told a congressional committee that the U.S.A. would need an army of between 3,000,000 and 4,000,000 men to defend the western hemisphere.

London verified report that German artillery on the French coast had been bombarding the southeastern coast of England.

Pres. Roosevelt declined, because of the press of official duties, Mr. Willkie's challenge to debate the issues of the campaign.

Italy proclaimed a blockade of all British possessions in the Mediterranean, along the Red sea, the Gulf of Aden and the coast of colonies in South Africa.

21 **Congress** amended U.S. neutrality law to permit entry of American ships into the war zone to evacuate children.

22 **Pres. Roosevelt** and Prime Minister Mackenzie King of Canada appointed joint board of defence consisting of five members from each country.

Pres. Ortiz of Argentina resigned in the midst of a crisis growing out of charges of corruption in the purchase of land for an airport.

Japan recalled 40 diplomats, including the ambassador to the U.S.A.

Egyptian war minister announced that Egyptian forces had joined British troops to repel any Italian invasion.

Relations between Greece and Italy reached new crisis; British announced that the royal navy and air force would go to the aid of Greece if she resisted invasion by Italian forces on the Albanian frontier.

French Foreign Minister Baudouin denounced Great Britain for its refusal to lift blockade of French food imports.

U.S. military plane with speed of more than 500 m.p.h. demonstrated to defence council; army also announced construction of bomber capable of non-stop flight across the Atlantic and return.

Working committee of the All-India Nationalist congress voted to reject British offer of ultimate self-rule for India.

23 **Pres. Roosevelt** said that unless congress passed the army conscription bill within two weeks it might set the defence program back a year.

French council of ministers approved law restricting consumption of beverages with a high alcoholic content and providing that on Tuesdays, Thursdays and Saturdays only wine, beer and fruit juices could be sold.

24 **Governor of Bermuda** told the colonial assembly that the Great sound would be offered to the U.S.A. for an air base.

Argentine congress, by vote of 170 to 1, refused to accept resignation of Pres. Ortiz.

Harry L. Hopkins resigned as U.S. sec'y of commerce.

Revolutionary frigates "Constitution" and "Constellation" were put in commission on the active list of the U.S. navy.

25 **London "City"** bombed by German planes.

26 **Fourtowns** in County Wexford, Eire, were bombed by planes supposed to be German.

Berlin experienced first sustained air raid by British.

27 **Clashes** between Rumanian and Hungarian troops were followed by Axis demand for a conference in Vienna between the Hungarian and Rumanian foreign ministers on the one hand and the foreign ministers of Germany and Italy on the other to find a way to keep the peace.

France retired 85 members of the diplomatic and consular corps, including 15 ministers plenipotentiary.

Governor of Chad in French Equatorial Africa announced colony would align itself with Gen. de Gaulle's "free Frenchmen."

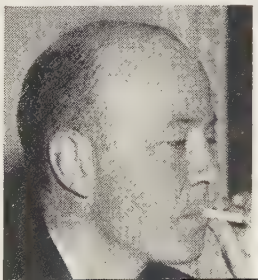
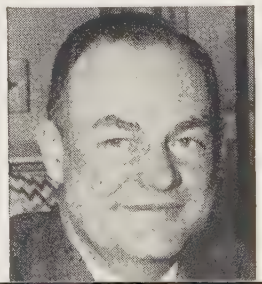
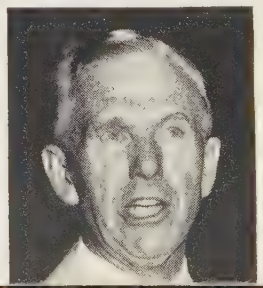
Sen. Charles L. McNary (Rep., Ore.) accepted Republican nomination for vice-presidency.

Pres. Roosevelt signed bill passed Aug. 23 authorizing him to call out the U.S. national guard and the organized reserves for a year's service.

28 **U.S. transport** "American Legion" arrived in New York city from Petsamo, Finland, with 870 war refugees, including the crown princess of Norway and her three children.

Italian planes bombed Port Said for first time.

Premier Konoye of Japan, after consultation with the emperor, announced that he did not intend

AUGUST—*Continued*

to set up a single party system, because the privilege of assisting the throne "cannot be monopolized by a single individual or a single party."

Sec'y Hull of the U.S. state department, taking note of the 12th anniversary of the signing of the Kellogg-Briand pact outlawing war, said that the soundness of its underlying principle had not been affected by what had happened since.

29 **Gen. de Gaulle** announced that the greater part of French Equatorial Africa had decided to join the British in fighting Germany and Italy.

30 **Sir George Paish,** accused of attempting to involve the U.S.A. in war, was advised by the British ambassador in Washington to return to England at once.

Yielding to pressure from Germany and Italy at the Vienna conference, Rumania agreed to cede approximately one-half of Transylvania to Hungary on the promise that all new boundaries would be defended by the Axis; Rumanian crown council approved the arrangement on Aug. 31.

31 **Mexican court** fixed value of expropriated oil lands at $35,525,000, which, after deduction of $23,400,000 for claims of various kinds, left $12,125,000 for the owners.

The count of Paris, succeeding his father as pretender to the French throne, promised to fight for the restoration of his country.

Frank C. Walker of Pennsylvania nominated postmaster general to succeed James A. Farley.

SEPTEMBER

1 **Pres. Roosevelt** issued first order calling out 60,000 members of the national guard from 26 states for a year's service.

Dr. Carlos Arroyo del Rio inaugurated president of Ecuador at Quito.

2 **Pres. Roosevelt** dedicated the Chickamauga dam near Chattanooga, Tenn., and the Great Smoky Mountain national park on the border of Tennessee and North Carolina and made speeches in which he warned the country of danger from abroad and urged unity in support of national defence.

3 **Pres. Roosevelt** informed congress that he had made an agreement with Great Britain under which the U.S.A. obtained the right to lease sites and build air and naval bases in the Bahamas, Jamaica, St. Lucia, Trinidad, Antigua and British Guiana in return for 50 over-age destroyers and that the British had given the U.S.A. the right to build similar bases in Bermuda and Newfoundland.

A pitched battle between Hungarians and Rumanians protesting against the transfer of one-half of Transylvania to Hungary resulted in the death of 180 soldiers and civilians.

French cabinet repealed the law of 1904 which suppressed religious schools.

4 **Sec'y of State Hull** informed the Japanese gov't that any change in the status of French Indo-China would have an "unfortunate effect" on American public opinion.

King Carol of Rumania appointed Gen. Ion Antonescu as premier, dissolved parliament by decree, suspended the constitution and gave supreme power to Antonescu.

5 **Costa Rica** offered to lease to the U.S.A. a naval and air station on Cocos island.

6 **King Carol,** yielding to pressure from the new premier and the pro-nazi Iron Guard, abdicated in favour of his 18-year-old son Prince Michael (Mihai).

All lodges of Freemasons in Holland were disbanded by the German authorities for "pernicious activity."

Gen. Maxime Weygand was relieved as French minister of war and sent to Africa to halt the defection of French colonies there.

7 **Former premiers** Daladier and Reynaud and Gen. Gamelin were arrested preparatory to trial on the charge of responsibility for the defeat of France.

Sec'y of State Hull announced that the 20 Latin-American republics were free to use the naval and air bases which the U.S.A. obtained under lease from Great Britain.

9 **Pres. Roosevelt** signed supplementary defence appropriation bill for $5,246,000,000 and immediately thereafter the navy department awarded contracts for 200 warships, including 7 battleships.

Tel Aviv, Palestine, was bombed by Italian planes; 112 persons killed.

11 **Reichstag** building damaged by British in raid on central Berlin.

Prime Minister Churchill warned the British people to be prepared for an attempted German invasion within a week.

Pres. Roosevelt, in an address to union convention in Washington, promised that there would be no change in the hour and wage laws and said that he had "one supreme determination—to do all that I can to keep war away from these shores for all time."

Solicitor Gen. Francis Biddle told the American Bar association convention in Philadelphia that there should be more concentration of power in the hands of the president in order to provide adequately for national defence.

Damage to Buckingham palace by German delayed aerial bomb on Sept. 10 announced in London.

12 **Mexican congress** formally declared that Gen. Manuel Ávila Camacho was elected president July 7 with 2,476,641 votes to 151,101 for Gen. Almazán.

Italian forces crossed Libyan frontier to invade Egypt.

13 **Pres. Roosevelt** sent to the senate the nomination of Jesse Jones of Texas to be sec'y of commerce after congress had passed a law permitting him to remain as Federal Loan Administrator while sitting in the cabinet.

14 **George Scalise,** former president of the Building Service Employes International union, was convicted in New York city on charges of forgery and theft from the treasury of the union.

U.S. naval statement declared that the policy of maintaining an Atlantic fleet which could be expanded into a two-ocean fleet had been superseded by a policy of maintaining both a Pacific and an Atlantic fleet in peace as well as in war.

U.S. congress passed the selective service bill providing for the registration of all men between the ages of 21 and 35, with a proviso that not more than 900,000 were to be drafted in any one year; Pres. Roosevelt asked congress for $1,600,000,000 to pay the cost of the first year's training of those drafted.

15 **Ex-Premier Blum** of France was arrested to be tried on charges growing out of the defeat by Germany.

Princess Helen, divorced wife of ex-King Carol of Rumania, arrived in Bucharest and was welcomed by her son, King Michael.

All-India congress working committee approved a resolution withdrawing a provisional offer to co-operate with Great Britain.

16 **Pres. Roosevelt** signed the selective service bill and called on all men within the prescribed age limits to register Oct. 16.

Sam Rayburn (Dem., Tex.) elected speaker of the house of representatives to succeed the late Speaker Bankhead.

Wendell L. Willkie, Republican presidential nominee, began his formal campaign for election with a speech at Coffeyville, Kan., where he taught school as a young man.

Italians occupied Sidi Barrani on Egyptian coast after sharp engagement with British.

17 **Republic of San Marino,** northern Italy, repealed its declaration of war against Germany, made in 1915, and declared war upon Great Britain.

18 **Pres. Roosevelt** signed bill extending supervision of the Interstate Commerce commission to include busses and all other interstate common carriers except aeroplanes.

19 **Gen. Manuel Ávila Camacho,** president-elect of Mexico, announced that no communists would be permitted to collaborate with his gov't.

John W. Davis, Democratic presidential nominee in 1924, appeared before a senate committee to urge adoption of a constitutional amendment limiting president's office to a single term of six years.

20 **Pres. Roosevelt,** in an address at the University of Pennsylvania, said that so long as there are free elections there is no danger of tyranny.

21 **Pres. Cárdenas** of Mexico issued a decree granting Mexicans exclusive rights of fishing off the west coast of the country where Japanese under the guise of fishermen had been engaged in mysterious operations for several years.

Preliminary figures for U.S. census of 1940 placed population at 131,409,881.

Four members of the Egyptian cabinet resigned in protest against the refusal of the gov't to declare war and place the army at the disposal of Great Britain.

The former mayor and chief of police of Detroit were held with 135 others for trial on charges of conspiracy connected with the alleged protection of gambling in the city.

22 **Marc de Tristan,** three-year-old son of Count de Tristan kidnapped near his home in Hillsborough, Calif., Sept. 20

SEPTEMBER—*Continued*

by a man who demanded $100,000 ransom, was rescued by two hunters in the mountains 200 mi. away after they captured the suspected kidnapper, a German alien who entered the country in 1935.

London announced that the "City of Benares," a refugee ship carrying 406 persons, including 90 children, to Canada, was torpedoed by a submarine Sept. 17, causing the deaths of 83 children and 210 adults.

The governor general of Indo-China agreed to permit the Japanese to establish three air bases in Tongking, to garrison them with not more than 6,000 troops and to maintain a small force at Hai-phong; despite this agreement the Japanese crossed the northern border and attacked the French defenders.

23 Lawrence W. Robert, Jr., of Atlanta, Ga., sec'y of the Democratic national committee under criticism in congress because his architectural firm had received gov't contracts yielding $900,000 in fees, resigned his secretaryship.

Pres. Roosevelt called upon the governors of the states to set up boards to supervise the registration of men under the selective service law, beginning Oct. 16.

Germany warned Egypt and Greece that they should renounce their ties with Great Britain; Egypt was placed under martial law.

24 Defense Communications board established by Pres. Roosevelt to prepare plans for the co-ordination of communication systems in national defence.

Berlin announced that Finland had consented to the transport of German supplies and soldiers through the northern part of the country to Norway.

French planes dropped bombs on Gibraltar in retaliation for British attack on Dakar, Senegal, on Sept. 23.

25 British abandoned the attempt begun Sept. 23 to land "free French" troops under Gen. de Gaulle at Dakar, Senegal, after the French forces in the colony, loyal to the Vichy gov't, resisted the attack.

The German high commissioner for Norway set up a gov't with Vidkun Quisling, Norwegian nazi, as its head.

The U.S. Export-Import bank loaned $25,000,000 to China to be secured by $30,000,000 worth of tungsten to be shipped to the U.S.A.

The Democrats in the house of representatives elected John W. McCormack of Massachusetts to succeed Sam Rayburn, new speaker, as floor leader.

26 Pres. Roosevelt placed an embargo on the shipment of steel and iron scrap, effective Oct. 16, to any point outside the western hemisphere with the exception of Great Britain.

A lifeboat containing 40 adults and 6 children from the "City of Benares," torpedoed Sept. 17, was found 600 mi. from land and its passengers were rescued.

Milo J. Warner of Toledo, O., was elected commander of the American Legion at its Boston convention.

27 Representatives of Germany, Italy and Japan signed a treaty in Berlin under which Japan recognized German and Italian leadership in the creation of a "new order in Europe" and Germany and Italy recognized the leadership of Japan in the creation of a new order in "the greater East Asia"; the three powers agreed to assist one another with military and other means if one of them was attacked by any power not involved in the European or the Sino-Japanese war.

Pres. Roosevelt promoted 84 colonels to the rank of brigadier general and 29 brigadier generals to the rank of major general.

U.S. senate ratified the Havana treaty under which the 21 American republics agreed to prevent transfer of any territory in the western hemisphere from one non-American power to another.

28 While 408 combat planes flew above the new airport in Washington, Pres. Roosevelt laid the cornerstone of the Administration building and said that the planes were "symbolic of our determination to build up a defence . . . capable of overcoming any attack against us."

30 Prime Minister Churchill, in an address broadcast to Czechoslovakia, said that freeing that country was one of the British war aims.

OCTOBER

1 Dr. Arnulfo Arias was inaugurated as president of Panama.

Military delegations from Bolivia, Colombia, Costa Rica, the Dominican Republic, Guatemala, Honduras, Panama, Peru and Uruguay, in the U.S.A. on a tour of inspection, were welcomed in Washington by Pres. Roosevelt.

Congress passed excess profits tax bill estimated to yield $500,000,000 the first year and $1,000,000,000 yearly thereafter.

2 U.S. navy department began organization of a patrol force of 125 ships in the Atlantic supported by an undisclosed number of planes.

3 U.S. Sec'y of War Stimson announced the organization of a parachute corps in the U.S. army.

Neville Chamberlain, Lord President of the Council in the British cabinet, resigned and was succeeded by Sir John Anderson.

Great Britain levied a sales tax of 24% on luxuries and 12% on other items, exclusive of food, fuel, gas, electricity and water.

Russia abandoned its system of free universal education and began to charge tuition for students in high schools and colleges.

4 Hitler and Mussolini, accompanied by their foreign secretaries, conferred in Brenner pass.

5 Premier Konoye of Japan said that if the U.S. recognized Japanese leadership in East Asia, Japan would recognize a similar leadership of the U.S.A. in the western hemisphere.

Sec'y of the Navy Knox ordered into active service all organized naval and marine reserves, to the number of 27,591.

8 U.S. consuls in the Far East were instructed by the state department to advise all Americans to leave Japan, Manchoukuo, China, Indo-China, Chosen, Formosa and Hong Kong.

German troops in large numbers moved into Rumania "to instruct the Rumanian army in Nazi methods of warfare" and to guard the oil fields against sabotage.

Cincinnati defeated Detroit for the world's baseball championship, four games to three.

Prime Minister Churchill announced that the Burma road which was closed July 17 would be reopened Oct. 17 for the transit of military and other supplies to China.

9 An article in Premier Mussolini's newspaper offered to give the U.S. Canada, Newfoundland, the Bahamas, Bermuda, Jamaica and even Australia and New Zealand if it would remain neutral in the establishment of a "new order" in Europe.

Winston Churchill was unanimously elected head of the British Conservative party as successor to Neville Chamberlain.

General Charles de Gaulle landed at Duala, French Cameroons, to take charge of the "Free French" forces there.

A German bomb dropped through the roof of St. Paul's cathedral in London, wrecking the high altar.

10 Pres. Roosevelt ordered the impounding of $100,000,000 of Rumanian funds in the U.S., bringing the total of impounded funds belonging to nations invaded by Germany to about $3,000,000,000.

11 Marshal Pétain announced that the reorganization of France as a national fraternity depended upon the will of the conqueror.

Fulgencio Batista was inaugurated as president of Cuba.

Japanese Foreign Minister Matsuoka, modifying a previous statement by Premier Konoye, said that the treaty with Germany and Italy was a peace measure and was not directed against the U.S.

An official broadcast from Ankara, Turkey warned the Germans against a drive into the Near East and announced that the way there was guarded by 2,000,000 bayonets.

Diplomatic relations between Spain and Chile, broken in July, were resumed.

Russia and Finland agreed to demilitarize the Aland islands at the entrance to the Gulf of Bothnia.

12 Pres. Roosevelt said that no combination of dictator nations in Europe or Asia would stop U.S. aid to the British and that the U.S. would defend its right to peaceful commerce in the Atlantic and Pacific oceans.

Clarence A. Dykstra, president of the University of Wisconsin, accepted appointment as director of selective service.

13 The "Yankee Clipper" of the Pan American airways made a round trip flight from New York city to Bermuda in less than 12 hours, the first such trip on record.

14 The chief of staff of the Brazilian army and the inspector general of the army of Argentina arrived in the U.S. to inspect the national defences.

15 Germany took control of the production and distribution of Rumanian oil.

16 The French gov't issued a decree, based on the armistice terms, forbidding the manufacture in France or its colonies of any war materials, including planes, guns, warships and explosives.

OCTOBER—*Continued*

Approximately 16,000,000 U.S. men between the ages of 21 and 35 registered for the draft under the selective service law.

18 Several hundred trucks loaded with munitions of war for the Chinese started for Chung King over the reopened Burma road.

The British air ministry announced that German troops had embarked on ships for the invasion of England on Sept. 16, but that the attempted invasion was prevented by the activity of the royal air force.

Pres. Roosevelt signed a bill requiring registration of all foreign controlled organizations and all those engaged in any kind of activity aimed at the overthrow of the U.S. gov't.

19 Yugoslavia signed a trade agreement with Germany.

Former Premiers Blum and Reynaud and former Minister of the Interior Mandel were charged by the French War Guilt court with betrayal of duties, embezzlement and speculation in the national currency.

Italian planes bombed American-owned oil refineries on the island of Bahrein in the Persian Gulf.

20 Italian planes dropped bombs on Cairo for the first time.

21 Prime Minister Churchill, in an address broadcast to France, appealed to the French to resist all efforts to persuade them to join the Germans in fighting Great Britain.

A spokesman for the Moslems of India denounced the Italian attack on the island of Bahrein as "an insult to Islam and the East," and said that the Italians had committed an unforgivable sin by flying over Mecca during the holy month of Ramadan.

President Cárdenas, as "an act of continental solidarity," cancelled the oil exploration grant made earlier in month to Japanese interests in Mexico.

22 Conference between Hitler and French Vice Premier Laval announced in Berlin.

Pres. Roosevelt set up a board within the defence commission with authority to order priority of deliveries under army and navy contracts.

U.S. war department, under authority of the law of Oct. 10, took possession of 100 warplanes destined for Sweden.

London announced that British citizens had been advised to leave Japan and Japanese-occupied territory.

Removal of many thousands of children from Berlin, Hamburg and other German cities to places of safety in the country announced in German capital.

23 Chancellor Hitler of Germany and General Franco of Spain conferred at the French-Spanish border.

Vichy gov't declared that under no circumstances would France make war on Great Britain or permit the Axis powers to use the French navy.

Japan denounced 1911 agreement with the United States, Russia and Great Britain for protection of fur bearing seals in the North Pacific ocean.

24 Chancellor Hitler and Premier Pétain met for conference in Hitler's private train somewhere in France.

25 John L. Lewis, head of the C.I.O. urged all members of the organization to vote for Willkie for president and said that if they failed to elect Willkie he would accept this decision as an indication of a lack of confidence in his leadership and would retire.

Col. Benjamin O. Davis was promoted by the president to the rank of brigadier general, the first Negro to hold such a commission in the U.S. army.

26 Vichy announced that Hitler and Pétain had agreed in principle on Franco-German co-operation "to reconstruct peace in Europe."

Pres. Roosevelt notified the French gov't that close military co-operation with Germany would bring about the occupation of Martinique and French Guiana by the American republics.

27 The World's Fair in New York city closed.

U.S. Ambassador Joseph P. Kennedy arrived in New York city from London and went at once to Washington to confer with the president.

Gen. Juan A. Almazán, who was defeated in the Mexican presidential election of July 7, announced in Baltimore that he would take office on Dec. 1 with the backing of the Mexican army.

28 Italy invaded Greece at 6 A.M., three hours after issuing an ultimatum which accused Athens of unneutral conduct; Premier John Metaxas rejected Rome's demands and declared war; Great Britain promised Greece all possible assistance.

Hitler and Mussolini met in Florence for reported consultation about peace terms with France.

29 U.S. draft lottery held in Washington; first number—158—was drawn by Sec'y of War Stimson.

President Cárdenas announced that American naval and air bases would be established in Mexico under Mexican control.

30 Great Britain landed marines on Greek islands and mined Greek harbours.

31 Pres. Roosevelt dedicated the new National Health institute at Bethesda, Md.

London reported that British agents in the U.S. had been authorized to spend $50,000,000 for American ships as replacements for vessels sunk by submarines.

Vice Premier Laval of France was quoted as saying in an interview that the victories of the totalitarian powers had convinced him that democracy was lost throughout the world.

Japan announced withdrawal of its troops from Kwangsi province in China, bordering on French Indo-China.

NOVEMBER

1 Naples bombed for first time by British; Italian planes raided Salonika.

Pres. Inonu of Turkey announced that his country would preserve its neutrality and assured the people that relations with Russia were friendly.

2 Travellers arriving in Bucharest report that Russia had assembled 31 divisions of troops and 3 brigades of mechanized equipment in Bessarabia and Northern Bukovina.

3 Acting Pres. Castillo of Argentina called for 5,000 volunteers to train as air pilots.

4 Spain took possession of the international zone in Tangier which was occupied by Spanish troops on June 1.

5 Pres. Roosevelt was re-elected by 449 electoral votes to 82 for Wendell L. Willkie; the Democrats retained control of congress, losing 4 seats in the senate and gaining 9 in the house of representatives.

Prime Minister Churchill announced that the British had established an air and naval base on the Greek island of Crete.

6 Comment in Europe and Latin America indicated gratification over the re-election of Pres. Roosevelt.

Chile made a claim to islands in the Antarctic region and to part of the South Polar continent.

Jawaharial Nehru, selected to lead a campaign of civil disobedience in India, was sentenced to imprisonment for four years by an Anglo-Indian court.

7 Pres. Roosevelt returned to Washington from Hyde Park, N.Y., and was welcomed by enthusiastic crowds.

The 2,800-ft. span of the suspension bridge between Tacoma, Wash., and the Olympic peninsula was wrecked by a wind storm and fell into Puget sound.

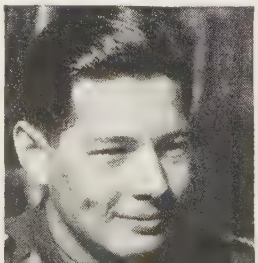
Prime Minister de Valera of Eire announced that the British would not be allowed to use nation's ports.

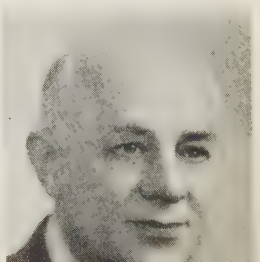
The British house of commons, to avoid possible bombing, met outside the house of parliament in an unnamed hall.

8 Pres. Roosevelt announced that about one-half of the planes and other war materials produced in the U.S. would be allotted to Great Britain.

The pictures on this page are, left to right:

WALKER	Aug. 31
MICHAEL	Sept. 6
JONES	Sept. 13
DE GAULLE	Sept. 25
DYKSTRA	Oct. 12





NOVEMBER—*Continued*

Hitler, in Munich to celebrate the anniversary of the beer hall Putsch, said he rejected any compromise and would fight until there was a decision; about an hour after Hitler had finished his speech British planes, aiming at railroad lines in the city, dropped bombs on the hall in which he had appeared.

9 **Pres. Roosevelt** issued a proclamation setting Nov. 21 as national Thanksgiving day.

10 **54,000 delegates** from all parts of Japan gathered before the palace in Tokyo to honour the emperor on the anniversary of the founding of the empire.

11 **Work on the Costa Rican section** of the Pan-American highway was begun.

Wendell L. Willkie, in a radio address, called on all those who voted for him Nov. 5 to unite with all others in national defence, but to preserve an effective "loyal opposition" to the party in power for the good of the nation.

Libreville, capital of Gabon, French Equatorial Africa, surrendered to the "Free French" forces of Gen. de Gaulle.

12 **Premier Molotov of Russia** arrived in Berlin to confer with Chancellor Hitler.

Pres. Roosevelt appointed Henry A. Wallace, vice president-elect to represent him at the inauguration of the president of Mexico on Dec. 1.

13 **Prime Minister Churchill** announced that the British naval air force had disabled 3 Italian battleships, 2 cruisers and 2 fleet auxiliaries in the harbour of Taranto on the night of Nov. 11–12.

14 **German planes,** in retaliation for the British bombing of Munich, dropped bombs on Coventry in the English midlands, killing about 200 persons, injuring 800 and wrecking most of the buildings in the city.

The pictures on this page are, left to right:

ROOSEVELT	Nov. 5
BORIS	Nov. 17
BADOGLIO	Dec. 6
LAVAL	Dec. 13
HALIFAX	Dec. 23

The Vichy gov't protested to Germany against the expulsion of 800,000 French-speaking residents of Lorraine.

Following the conference between Hitler and Molotov, it was announced in Berlin that agreement had been reached on all questions of importance to Germany and Russia.

Germany authorized the use of dog meat for human consumption beginning on Jan. 1.

The American Academy of Arts and Letters awarded to Ellen Glasgow the Howells medal for the most distinguished work in fiction during the past five years.

15 **Pres. Roosevelt proclaimed** the neutrality of the U.S. in the Italo-Greek war.

The Vultee Aircraft factory at Downey, Calif., engaged in production of war planes, was shut down by a strike of the United Automobile Workers union.

Henry A. Millis, emeritus professor of economics in the University of Chicago, appointed to succeed J. Warren Madden on the National Labor Relations board.

16 **The Communist party of the U.S.** voted to end its affiliation with the Communist International.

17 **King Boris of Bulgaria** went to Berlin to confer with Hitler.

18 **Premier Mussolini said** that Italy would continue the war against Greece until it was won.

Selection of sites for seven land, naval and air bases in British Atlantic possessions was announced by U.S. navy department.

19 **Pres. Roosevelt urged** the convention of the American Federation of Labor to compose its differences with the C.I.O.

20 **Hungary signed a treaty** in Vienna under which it joined the alliance of Germany, Italy and Japan.

21 **32 states observed Thanksgiving day** as recommended by the president.

The Dies committee issued a "white paper" containing evidence intended to prove connection of German diplomatic and consular officials with subversive propaganda in the U.S.

22 **Greek troops occupied** Koritza (Kortcha), main Italian military base in Albania.

Philip Murray, vice president of the United Mine Workers of America, was elected president of the Congress of Industrial Organizations to succeed John L. Lewis.

Because the roof of the capitol was declared unsafe, the senate voted to meet in the old supreme court chamber and the house of representatives decided to meet in the caucus room of its office building until the roof could be repaired.

23 **Rumanian representatives in Berlin** signed a treaty joining the alliance of Germany, Italy, Japan and Hungary.

24 **Slovakian representatives in Berlin** signed a treaty joining the alliance of Germany, Italy, Japan, Hungary and Rumania.

25 **U.S. supreme court reversed** the conviction of a Texas Negro because Negroes were excluded from grand jury which indicted him.

26 **The convention** of the American Federation of Labor approved a resolution calling on the member unions to oust officials found using their positions for personal gain.

Gen. Almazán, who had insisted that he won the Mexican presidential election, returned to Mexico City from the U.S. and renounced all claim to the office.

Logan-Walter bill, subjecting decisions of gov't boards and agencies to judicial review, passed unexpectedly by U.S. senate, 27 to 25.

Pres. Roosevelt sent to the senate the nomination of Rear Admiral William D. Leahy as ambassador to France to succeed William C. Bullitt.

The president signed Ramspeck bill placing 200,000 temporary federal employees into the classified civil service.

The strike in the Vultee aircraft factory at Downey, Calif., was settled after an increase of pay had been granted and a plan for settling future disputes had been agreed upon.

27 **The Dies committee issued** a "red book" containing evidence of alleged subversive activities of communists in the U.S.

Members of the Nazi Iron Guard in Rumania broke into the military prison at Jihlava and killed 64 former officials of ex-King Carol, charged with the death of Corneliu Codreanu, leader of the Iron Guard, and 13 others in 1938.

28 **Thanksgiving day** was observed in 16 states.

20 more Rumanian political leaders, including former Premier Nicolas Iorga, were assassinated; Rumanian and German troops moved into Bucharest to preserve order.

A riotous mob of supporters of Gen. Almazán gathered about the U.S. embassy in Mexico City on the arrival of Henry A. Wallace, to protest against the validity of the election of Gen. Avila Camacho.

William Green was re-elected president of the American Federation of Labor.

Kjösti Kallió, president of Finland, resigned because of ill health.

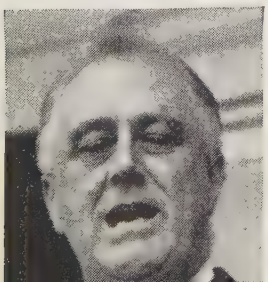
29 **Gen. de Gaulle** reported in London that "Free France" had 30,000 men under arms, 20 warships, 1,000 aviators and 60 merchant ships.

30 **Pres. Morinigo** proclaimed a dictatorship in Paraguay.

Germany announced that Lorraine had been incorporated into the Reich and united with the Saar region under the name of Westmark.

A treaty formally recognizing the puppet gov't of China under Wang Ching-wei was signed by Japan in Nanking.

Following the Japanese recognition of Wang Ching-wei's gov't the U.S. announced that arrangements had been made to advance $100,000,000 to the gov't of Chiang Kai-shek.



DECEMBER

1 Joseph P. Kennedy announced his resignation as U.S. ambassador to Great Britain, to take effect on the appointment of his successor.

Gen. Manuel Avila Camacho took the oath of office as president of Mexico and pledged his support to continental solidarity against foreign aggression.

Gen. Antonescu, Rumanian premier, said that Rumania would never renounce its claims to Transylvania, part of which had been annexed by Hungary.

2 Congress passed Logan-Walter bill providing for judicial review of decisions of the National Labor Relations board and other executive agencies.

Pres. Roosevelt signed a bill making sabotage a criminal offence in time of peace and another bill amending the Philippine constitution to change the presidential tenure from one term of six years to not more than two terms of four years.

3 Paul V. McNutt, Federal Security administrator, was named by the National Defense council as co-ordinator of all health, medical welfare, nutrition, recreation and other activities affecting U.S. national defence.

5 In a letter to the Great Lakes-St. Lawrence Seaway and Power conference in Detroit, Pres. Roosevelt said he was preparing for immediate construction of the waterway from the ocean to the Great Lakes.

The British house of commons, by a vote of 341 to 4, rejected a proposal to seek a negotiated peace.

Arrangements were completed by the U.S. to lend $50,000,000 to Argentina to stabilize its currency.

Russia informed Tokyo that its policy toward the gov't of Chiang Kai-shek in China was unchanged by Japanese recognition of Wang Ching-wei.

6 A Canadian official reported that 10,000 citizens of the U.S. had volunteered for service in the Canadian royal air force since May 1940.

Porto Edda occupied by Greeks.

Marshal Pietro Badoglio, chief of the general staff of the Italian army, was relieved of his command.

7 Pres. Roosevelt assured King George of Greece that the U.S. would extend to him such military aid as was possible.

8 Admiral Domenico Cavagnari, head of the Italian navy, resigned.

Italians abandoned Argyrokastron to Greek forces.

9 British mechanized forces began lightning drive against Italians in Egypt.

Japanese Foreign Minister Matsuoka said that the alliance with Germany and Italy was not made in contemplation of war against the U.S. and that Japan would not make war on the U.S.A. unless the latter was an aggressor.

10 The British gov't announced it would refuse permission for shipment of food to the continent through the blockade.

Great Britain announced credit to China of £10,000,000.

11 The British recaptured Sidi Barrani, advance base of Italian forces in Egypt, taking 20,000 prisoners, including three Italian generals.

Lord Lothian, British ambassador to the U.S., in a Baltimore address read by an associate a few hours before the envoy's death, said that the hope of the future depended on co-operation between the U.S. and the British Commonwealth of Nations, and that with American help the "gangster menace to human freedom" could be ended.

Arrangements for a loan of $60,000,000 to Argentina by the U.S. Export-Import bank were made, in addition to a previous loan of $50,000,000 from the stabilization fund; a loan of $7,500,000 to Uruguay was also authorized.

Election of local officials in all French cities with more than 2,000 population was abolished by decree of Premier Pétain.

12 Pres. Avila Camacho of Mexico directed the head of the Agrarian department to take the necessary steps to give farmers title to the communal lands on which they were working.

13 William S. Knudsen, of the National Defence commission, told the National Association of Manufacturers that he doubted the wisdom of a five-day week in defence industries as it was important that work be rushed with all possible speed.

After a stormy session of the French cabinet Premier Pétain ordered the arrest of Pierre Laval, vice premier and foreign minister, suspected of plotting against the gov't, abolished his office as vice premier and later appointed Pierre-Etienne Flandin as foreign minister.

14 Argentina and Uruguay agreed on the joint defence of the River Plate.

British troops reached vicinity of Egyptian-Libyan frontier and pursued retreating Italians across the border after recapturing Sidi Barrani.

15 The body of the Duke of Reichstadt, son of Napoleon I, removed from Vienna, was deposited in the Invalides in Paris beside the body of his father.

16 Premier Pétain was reported to have refused Germany permission to send troops through France to embark at a Mediterranean port for the relief of Italy.

U.S. supreme court, in a 6 to 2 decision, ordered the Appalachian Electric Power company to submit to the regulations of the Federal Power commission in the management of its dam in the New river, Virginia.

17 Plan to lend arms to Great Britain without immediate payment announced by Pres. Roosevelt.

18 Pres. Roosevelt vetoed the Logan-Walter bill; a motion to override the veto was defeated in the house of representatives.

Pierre Laval, deposed French vice premier and foreign secretary, was released from arrest and went to Paris after visit of Otto Abetz, German high commissioner in France, to Vichy.

20 Pres. Roosevelt created a new four-man defence council known as the office for production management and defense, with William S. Knudsen as its head.

Italian sources reported German planes were in Italy carrying reinforcements to the Fascist army in Albania.

London announced that a British fleet had made its way through the straits of Otranto Dec. 18 and bombarded Valona, Albania.

21 An official German spokesman said that the suggested seizure of German and Italian merchant ships in U.S. harbours and their transfer to Great Britain would be regarded as a warlike act.

Risto Ryti was sworn in as president of Finland.

22 Philip Murray, president of the C.I.O., proposed a plan for utilizing surplus capacity of motor car factories to produce 500 fighting planes per day after six months.

23 Viscount Halifax was appointed British ambassador to the U.S. to succeed the late Lord Lothian; Anthony Eden was named foreign secretary.

Rear Admiral William D. Leahy sailed from Norfolk, Va., on the U.S. cruiser "Tuscaloosa" to take up his duties as U.S. ambassador to France, the first ambassador to be sent to his post in a warship.

Prime Minister Churchill broadcast a plea to the monarchy, the church and the people of Italy to get rid of Mussolini and resume peaceful relations with Great Britain.

24 Japan and Thailand (Siam) proclaimed a treaty in which each pledged to respect the territorial integrity of the other.

25 Premier Eamon de Valera of Eire (Ireland) appealed to the U.S. for food and weapons.

20 German divisions were reported passing through Hungary and Rumania to the Bulgarian frontier; Russia was reported massing troops on the Rumanian frontier.

26 Unofficial two-day Christmas truce in aerial war between Great Britain and Germany ended by raid of lone bomber over mouth of Thames.

28 About 5,000,000 aliens were listed under the law requiring their registration in the U.S.

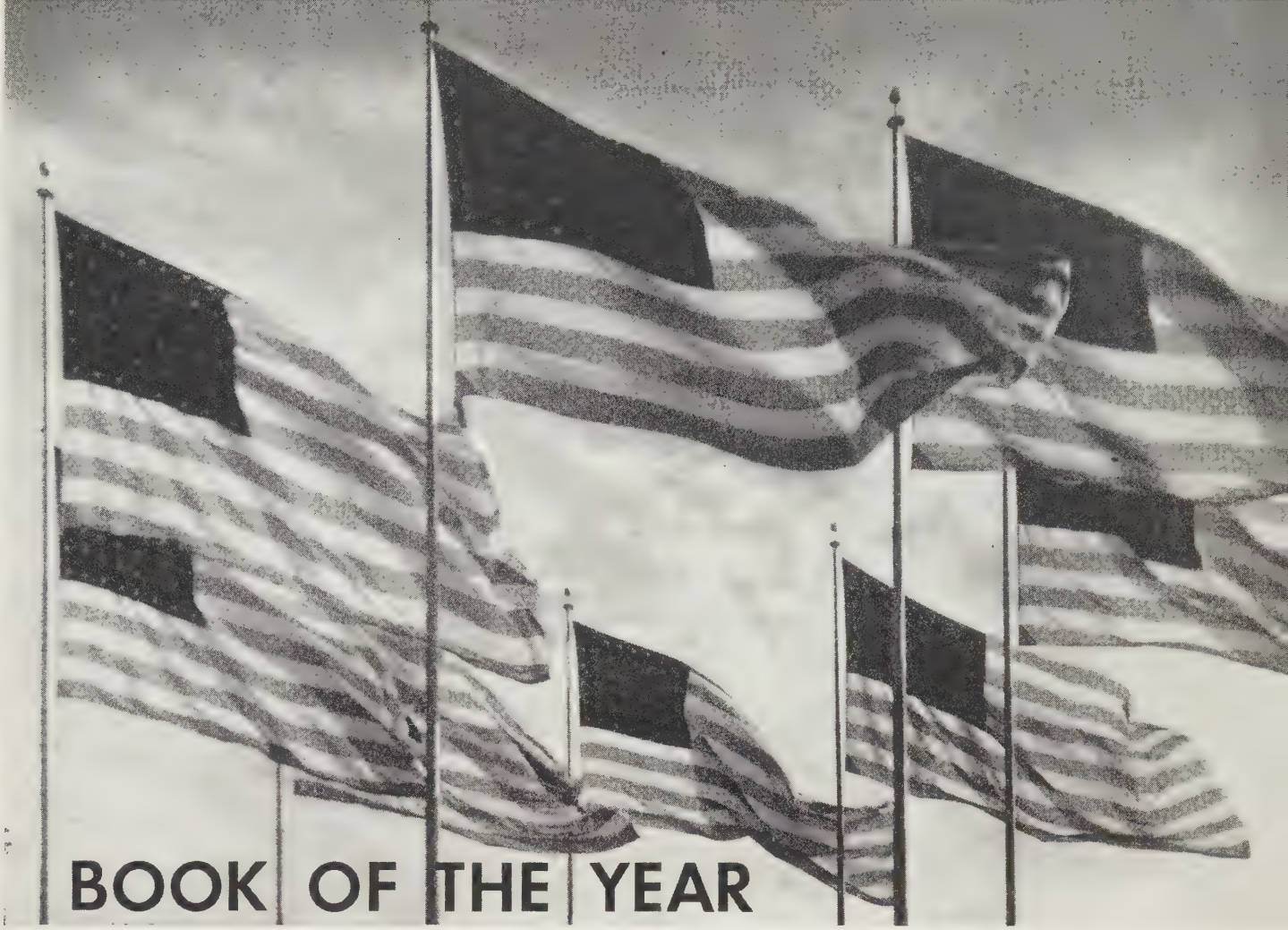
29 Pres. Roosevelt, in a broadcast address, said that his whole purpose was to keep the U.S. out of war while supplying to Great Britain and its allies all possible help in the way of shipping, munitions, planes and food; he also said he did not believe the Axis powers would win the war.

The Germans subjected London to one of the severest bombings of the war, dropping incendiary bombs on the heart of the city and causing destruction said to be as great as that from the great fire of 1666.

30 The National Student Federation of America withdrew from association with the American Youth congress because of opposition to the latter's radical tendencies.

31 Pres. Roosevelt sent a New Year's message to King Victor Emmanuel expressing the hope that Italy might enjoy the blessing of a righteous peace in 1941.

The American Red Cross reported it had given $16,690,000 in cash and supplies to war victims in nine countries.



BOOK OF THE YEAR

Abercrombie, John William (1866–1940), U.S. educator, was born in St. Clair county, Ala., May 17 and was graduated from Oxford college (Ala.) in 1886. After teaching in schools and colleges, he was made state superintendent of education in Alabama in 1898, serving until 1902 and again occupied the same post from 1920 to 1927. He was president of the University of Alabama from 1902 to 1911 and was elected to congress in 1912, serving two terms. He had been a member of the Alabama senate. At the time of his death in Montgomery, Ala., on July 2 he was supervisor of teachers' certification for the state.

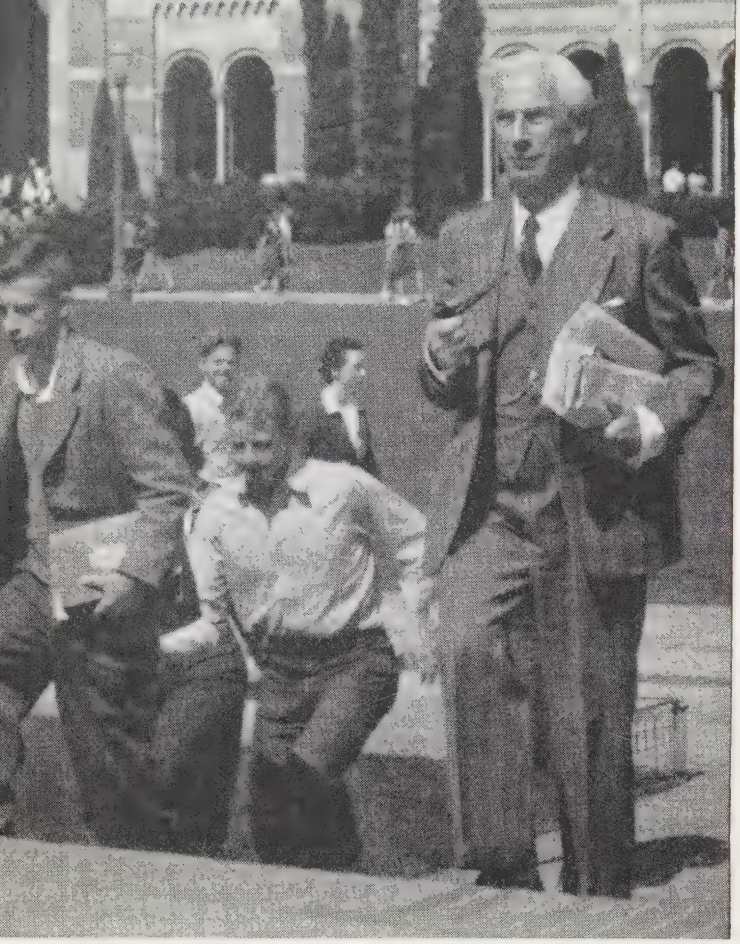
Abyssinia (Ethiopia): *see* Italian Colonial Empire.

Academic Freedom. The major scholarly associations in the United States of a general character have established academic freedom committees. This list, Jan. 1, 1941, included the American Association of University Professors, the American Federation of Teachers, the National Educational association and the Progressive Education association. On Nov. 8, 1940, a revised joint statement of academic freedom and tenure procedures was drafted at a meeting between representatives of the American Association of University Professors and the Association of American colleges, subject to ratification by both organizations in 1941. In the amended formulation the "full freedom" of the teacher "in research and in the publication of results, subject to the adequate performance of his other academic duties," was recognized. It was also agreed that the teacher should have freedom in discussing his subject in the classroom and that "when he speaks or writes as a citizen he should be free from institutional censorship or discipline." An instructor or person of higher rank would normally receive permanent tenure after serving a minimum of seven years at an institution. Seasoned teachers transferring to a new institution would serve a maximum probationary period of four years. Beyond such periods, the termination of appointments would be for "adequate cause" or for extraordinary and proven financial exigencies. Dismissal would be only after a hearing at which the teacher was afforded an adequate opportunity to defend himself.

The American Association of University Professors reported in 1940, 108 cases of alleged violation of academic freedom; the highest number in the history of the organization. Outstanding 1940 cases in which infringements to academic freedom and tenure were found included those at West Virginia university, Central Washington College of Education, the University of South Carolina and Simpson college. The Central Washington College of Education was placed by the association on its list of censured administrations.

Perhaps the most heated controversy of the year centred about the appointment of Bertrand Russell to the faculty of City college, New York, for a two-year term in the department of philosophy. Although Mr. Russell was listed as teaching courses in the interrelationships between science, mathematics and philosophy, objections were brought by citizens against the appointment because of his views upon marriage and politics. On March 30, 1940, Justice McGeehan of the state supreme court upheld a taxpayer's suit to revoke the appointment. Strenuous protests were lodged by scholarly associations, including the American Association of University Professors, claiming a violation of academic freedom. Though an appeal was taken from the decision, Mayor F. H. La Guardia of New York sought to close the issue by eliminating Mr. Russell's salary from the city budget.

The rising hysteria against "subversive influences" in academic circles called forth legislative inquiries into alleged



BERTRAND RUSSELL'S appointment to the staff of the College of the City of New York Feb. 26, 1940, caused a storm of protest from those opposed to his "immorality" and a counteracting defence from the champions of academic freedom

radicalism and led to statements by some college administrators which would tend to limit the scope of academic freedom. At the close of 1940, however, violations of academic freedom were still generally confined to the less prominent institutions. In one extreme case, a professor of modern languages in a southwestern state teachers college was dismissed because he wrote to his representative in congress, expressing his opposition to war and to the then pending selective service bill. (C. E. WA.)

Academy of Arts and Letters, American: *see* AMERICAN ACADEMY OF ARTS AND LETTERS.

Academy of Arts and Sciences, American: *see* AMERICAN ACADEMY OF ARTS AND SCIENCES.

Academy of Political and Social Science, American: *see* AMERICAN ACADEMY OF POLITICAL AND SOCIAL SCIENCE.

Accidents: *see* DISASTERS; INSURANCE, ACCIDENT AND HEALTH; INSURANCE, AUTOMOBILE; PSYCHOLOGY, APPLIED: *Accidents;* TRAFFIC ACCIDENTS.

Actors and Acting: *see* THEATRE.

Adams, Thomas (1871–1940), British town planning expert, was born in London, Sept. 10. He studied law, but abandoned it when he became interested in town planning. He planned the first "garden city" in England and on the passage of the town planning act in 1909 he was employed as an expert to pass on planning projects. In 1914 he founded and was the first president of the British Town Planning institute. He became adviser to the Canadian Conservation commission and submitted plans for several Canadian cities. He also made plans for a part of Greater London. He was employed by the regional planning commission of New York and was head of the corps of engineers, architects and draftsmen who made a plan in 1929 covering an area of 5,528 sq.mi. in New York, New Jersey and Connecticut which Mr. Adams thought should be organized as a separate city state. He lectured at the Massachusetts Institute of Technology and was an associate professor of research in the school of city planning at Harvard university. He died in Battle, Sussex, England, March 24.

Aden. Aden is a British colony, seaport and territory in Arabia, situated in 12° 45′ N. and 45° 4′ E., including Perim island, etc., in the strait of Bab-el-Mandeb between Africa and Arabia; area 80 sq.mi.; pop. (est. 1939) 48,338. Aden protectorate, including Sokotra on the Red sea coast, 112,200 sq.mi.; pop. (est.) 600,000. Governor: J. Hathorn Hall, C.M.G., D.S.O., O.B.E., M.C. Language: English and Arabic; religion: Mohammedan.

History.—In 1940 the secretariat was unified; there was no longer a civil secretary looking after the colony and a political secretary looking after the protectorate; these two offices were abolished and replaced by a chief secretary to the government. This change took effect on July 1. The finances of the colony and protectorate remained separate; that is, the colony paid its own way and the protectorate was financed by the colonial office. As part of the Aden centenary memorial an infant welfare clinic was opened. Child welfare and ante-natal services were functioning at the close of 1940 and a maternity ward was soon to be opened.

In the protectorate extensive agricultural developments took place, particularly in the production of vegetables of high quality, primarily for use in the colony, but eventually for the supply of ships as well. A beginning was made with road improvements in the protectorate.

After the entry of Italy into the war there were a number of air raids. The damage to property was negligible and the casualties few. This was largely due to the efficiency of the A.R.P. organization, both in regard to alarms and the provision of shelters. Long before the war, the possibility of raids had been foreseen and precautions taken, but the provision of public shelters and of sandbags for private houses was later greatly extended.

A new and important radio station was established in Aden, broadcasting in Arabic, French, Italian and Somali, thus serving the protectorate, British, French and Italian Somaliland and the Italian communities in Eritrea and Abyssinia.

For the convenience of shipping, a contraband control base was also established at Aden. (A. MN.)

Adjusted Compensation. On May 19, 1924, the World War Adjusted Compensation act was passed by the congress of the United States providing for the adjustment of the pay of veterans of the World War. In substance it bestowed basic service credit of $1.00 for each day's service in the United States and $1.25 for each day's service overseas, with deduction on account of the $60 bonus previously authorized and limited to a maximum of $500 for home service and $625 for overseas service. If service credits amounted to no more than $50, veterans were paid in cash, payments numbering 178,035 and aggregating $5,568,566.37 having been paid under this provision of the statute.

In the case of deceased veterans, service credits were payable to their dependents and such payments amounting to $49,099,142.26 have been made on 150,602 veterans' cases. To living veterans whose service credits exceeded $50 there have been issued 3,792,432 adjusted service certificates, the face values of which total $3,709,945,334.

These certificates having loan privileges are, in essence, paid-up 20-year endowment insurance policies, the maturity values thereof

approximating two and one-half times the service credit. A sum of $238,364,117 has been paid on 241,804 certificates because of maturity having been occasioned by the deaths of veterans.

Legislation enacted Jan. 27, 1936 made the face values of adjusted service certificates, less any outstanding loans and interest accrued prior to Oct. 1, 1931, payable as of June 15, 1936, upon application. The face values of the 3,509,808 adjusted service certificates upon which certifications have been made totalled $3,434,940,134, and the amount certified as payable after deducting outstanding liens was $1,920,288,441.70.

Payment was prescribed by the law to be made by the issuance of bonds of the United States in denominations of $50, odd amounts in excess of any multiples of $50 to be paid by checks. These bonds are dated June 15, 1936 and mature on June 15, 1945, but are redeemable at the option of the veteran at any time, interest accruing at the rate of 3% per annum except no interest accrued on bonds redeemed prior to June 15, 1937. In settlement the treasury department has issued to veterans bonds totalling $1,837,010,500 and has redeemed $1,575,980,650 of these bonds. The adjusted compensation work has to a large extent been completed, certification having been made on all certificates issued up to this time with the exception of 40,820 for which applications for settlement have not been received from veterans. All data herein cited are as of June 30, 1940. (*See* also VETERANS' ADMINISTRATION.) (F. T. HI.)

Adjusted Service Bonds: *see* ADJUSTED COMPENSATION.

Adler, Cyrus (1863–1940), U.S. educator, was born in Van Buren, Ark., Sept. 13 and died in Philadelphia, Pa., April 7. For a biographical sketch see *Encyclopædia Britannica,* vol. 1, p. 168.

Adult Education: *see* EDUCATION, ADULT.

Advertising. Unsettled world economic conditions, a presidential election and broader government surveillance of industry were important aspects of advertising development in the United States during 1940. The war continuing in 1940 dominated advertising activity in the United Kingdom. Advertising volume in Great Britain dropped 50% or more, accelerated during the six-month period following the invasion of the Low Countries. During the same six-month period, advertising rates rose approximately 25%. Advertising volume in the United States was $1,648,500,000 in 1940, an increase of 2·9%. Newspaper linage increased 1·9%; radio, 15%; magazines, 4·6%; outdoor, 3·4%. Farm paper linage decreased 2·0%. Direct mail advertising volume remained practically the same as 1939. These estimates were based upon a study for the publication, *Printers' Ink.*

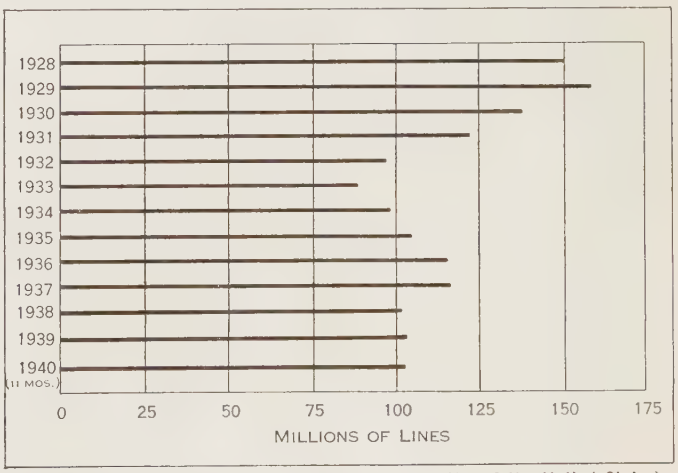
Copy and Layout.—U.S. advertising writers faced new problems in creating good selling copy in compliance with provisions of the Wheeler-Lea and the Food, Drug and Cosmetic acts. The picture-caption treatment, the continuity strip and the story methods of presenting advertisers' messages continued among the leading forms of technique. Humour was widely used. The war, national defence program and presidential election introduced into copy themes a new consciousness of U.S. ideals, institutions and U.S.-made products. Greater dramatic effects were achieved in layout by increased use of photography, particularly colour photography in magazines.

In Britain, the order to conserve newsprint imposed by the ministry of supply, which drastically reduced the number of pages in newspapers, affected copy and layout. Copywriters turned to short phrases and slogans, while layout men had to make ingenious use of small space. Copy themes were built around new arguments why products were good in wartime. Many advertisers of products such as motor cars, whose sales were controlled by government restriction or rationing, continued advertising to keep their brand names alive, but devoted their space to institutional and patriotic messages. Advertisers of such products as gasoline, motor oils, tea, margarine and others subject to government pooling and control discontinued advertising completely.

Newspapers.—*PM,* a five-cent daily newspaper of tabloid format was started in New York city on June 18 with no advertising, but contained a digest of advertising in other media as a service to readers. The 1940 local-national rate differentials study of the Association of National Advertisers, Inc., showed continuing expansion of the national rate over the local rate. The number of newspapers offering run of paper in colour increased. Basic Newspaper Group, Inc., was formed to restore newspapers as basic media and to promote the sale of space on long-term contracts with discounts similar to radio networks.

Newsprint prices doubled in Britain. To conserve paper, the ministry of supply limited national dailies to 6 pages, tabloids to 12 and the *London Times,* a two-penny paper, to 8. Weekly, Sunday and provincial papers were similarly limited. Circulation was held to levels prevailing in June and no new papers could be started without government permission. This ban was lifted for new Polish, French and Dutch dailies subsidized in some instances by their governments for the free peoples of these countries residing in Britain and abroad. Largest newspaper space purchasable was generally reduced to eight inches on two columns. As the year progressed, no rate schedules, preferred positions or insertion dates could be guaranteed. (*See* NEWSPAPERS.)

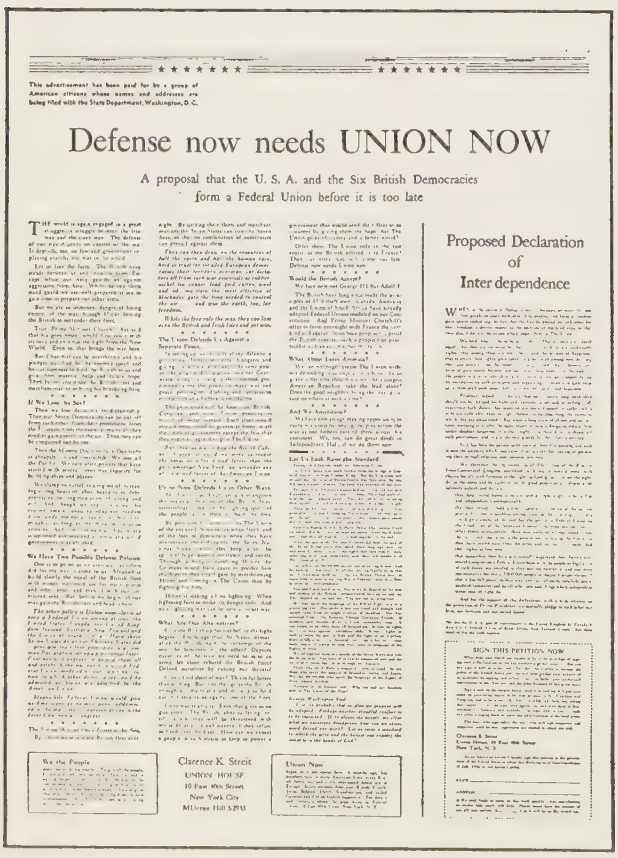
Radio.—Advertisers in the U.S. spent $200,000,000 for time on radio stations in 1940 and there were about 52,000,000 radio sets in use. In June, the Associated Press approved full commercial broadcasting of news. During the year, the Federal Communications commission gave the go-ahead signal to FM (frequency modulation) a new type of high-frequency broadcasting which involves the purchase of a new type of home receiving set, new types of transmitters by broadcasters, makes more stations possible than the 550- to 1600-kilocycle band permits, and provides staticless reception. There was a trend toward more sponsored quiz-type programs. One large U.S. broadcasting company began aggressive promotion of sponsored commercial, short-wave programs to Latin America. Eight U.S. advertisers were using this service. Development of Latin American service was hastened by new interest in western hemisphere solidarity and the opportunities offered to offset short-wave propaganda from European countries. British commercial radio advertising was virtually nonexistent in 1940. The government-owned BBC has never permitted sponsored commercial programs and the two principal radio sta-



NEWSPAPER ADVERTISING (total linage in 52 cities of the United States): average per month. Compiled by Media Records, Inc.

Above: NONINTERVENTIONIST U.S. newspaper advertisement of 1940

Below: THIS FULL-PAGE ADVERTISEMENT of Clarence K. Streit's "Union Now," appearing July 15, 1940, proposed an immediate federal union of the United States with the United Kingdom and its dominions



Above: AN EXTENSIVE CAMPAIGN of full-page newspaper advertisements was conducted in 1940 by the Committee to Defend America by Aiding the Allies

Left: POSTER distributed in mass quantities throughout the United States in 1940

Below: PATRIOTIC U.S. advertisement of 1940

tions on the continent which accepted commercial programs for British advertisers, ceased to operate due to the war. These were Radio Normandy and Radio Luxembourg. Effort was made for commercial broadcasting over an Irish station.

Magazines.—The Magazine Marketing service was founded in March. This will be supported by all national consumer magazines to promote magazines as an advertising medium and to serve advertisers, agencies and publishers as a clearing house for factual data on marketing, sales and advertising. (*See* MAGAZINES AND PERIODICALS.)

Outdoor.—Measurement of outdoor circulation by the Traffic Audit bureau was extended as a requisite to all members of the Outdoor Advertising association. This brought about an improvement in outdoor plants and an audited circulation increase of 7.5%, comparing the year 1940 with 1935. Poster advertising moved ahead with the growth of the self-service grocery business from 1% in 1930 to 35% in 1940, a development which influenced the importance of product and label identification of nationally advertised food products.

Films.—United States advertisers gave greater attention to commercial films. About 10,000 theatres out of 17,000 wired for sound Jan. 1, 1940, would accept short advertising playlets running 40 to 80 seconds. This offered a medium with 43,000,000 weekly circulation. High hopes for 1940 film advertising in Britain were dashed because of the inability of cinema managements to guarantee contracts due to black-outs and bombings.

Point-of-Purchase Advertising institute was founded to establish window and internal-store display as a definite advertising medium with factual data to prove its effectiveness.

Carcards.—Innovations in this medium included a new space offer of 11 by 28 inches at the same rate as the old standard offer of 11 by 21 inches.

Television.—Colour television was successfully demonstrated in 1940. The first sponsored news series designed for television was telecast in March. The year looked bright for television until a rule permitting restricted commercialization to become effective Sept. 1 was suspended by the Federal Communications commission.

Rotogravure advertising in the United States decreased 2·6% in 1940.

Consumers.—The consumer movement showed less antagonism and a willingness for co-operation on both sides. Harriet Elliott was appointed commissioner in charge of the consumer protection division of the National Defense Advisory commission. A committee on consumer relations in advertising was incorporated Jan. 5, 1940, to engage in fact finding and research on the economics of advertising and consumption. In April the Institute of Standards, Inc., was founded as a co-operative solution to problems resulting from the consumer movement.

Co-operative Advertising programs included a wide range of products, services and educational promotions. Among the largest was the $2,000,000 campaign of the Institute of American Meat Packers. State and community programs were used extensively to capitalize on the "See America First" movement. Thirty-seven out of 48 states had in 1940 state appropriations for promotional advertising.

Financial Advertising.—A new experiment in the history of financial advertising was started by the firm of Merrill Lynch, E. A. Pierce & Cassatt to dramatize its services in display space similarly to methods successful in other business.

Political Advertising in the 1940 U.S. presidential campaign displayed a more professional tone and more selling punch, presented with careful layout and illustrative technique. Radio took $2,500,000, largest share of the election budget; newspapers, $2,000,000. Outdoor, poster, displays, direct-mail and magazines accounted for the remainder. Many advertising executives participated actively. The *Christian Science Monitor* accepted political advertising for the first time in its history.

Research.—The accuracy with which market research polls forecast the 1940 election proved a point for the accuracy of advertising research methods in general. The 16th decennial census, taken in 1940, was a new aid to market information. An analysis of the people of the United States from the viewpoint of the family as a buying unit was completed by the publication *Printers' Ink*. The Bureau of Advertising of the American Newspaper Publishers' association and the Advertising Research foundation continued its joint study to determine current newspaper reader habits. The "eye camera," a photographic device for determining what people look at on a page of print and pictures, was a research experiment of the year.

Legislation.—The charge by the Federal Trade commission that the use of the *Good Housekeeping* "Seal of Approval" violated federal legislation continued in the spotlight of legal actions against advertisers in 1940. Five months of hearings in Washington, Chicago and New York were completed in July as the last of 160 witnesses completed testimony on a 6,900-page record. The American Newspaper Publishers' association intervened in the proceedings, claiming the case raised fundamental issues affecting the constitutional guaranty of a free press.

Passage of the first national labelling law, calling for correct labelling of wool products, marked a continuance of the government's attitude toward consumer protection.

Regulation and Ethics.—The department of justice filed a charge under the Anti-Trust act against eight tobacco manufacturers, claiming their vast advertising and promotional activities created a demand for products under brand names which forced wholesalers and retailers to handle such products on arbitrary terms.

A concern of radio advertisers was the controversy over the renewal of a contract involving royalties between ASCAP (the American Society of Composers, Authors and Publishers) and the broadcasting companies. The result was a boycott of ASCAP music on the airwaves and the formation by the National Association of Broadcasters of BMI (Broadcast Music, Inc.) to encourage broadcasting of non-ASCAP music.

In October the commercial section of the National Association of Broadcasters put into effect a code limiting time for commercial copy and clarifying "accepted standards of good taste."

Successful new contracts were signed between radio networks and the American Federation of Radio Artists regarding wage scales, for both sustaining and sponsored programs to run concurrently until Nov. 1, 1943.

Direct Mail Advertising association endorsed a campaign to free United States mails of foreign propaganda injurious to America and its institutions.

Retail Advertising.—Department store advertisers paid more attention to institutional programs, a trend traceable to problems in retail merchandising arising from decentralization of population and competition from other retail sources. Retailers became more research and consumer conscious. Radio gained a more conspicuous place. The U.S. as the world fashion centre provided new material for copy themes. More attention was paid to point-of-sale advertising.

War and Advertising.—According to a trade paper survey, the budgets of the largest advertisers in the U.S. were unchanged by the war. Advertising associations adopted such themes as "Make America Strong," and pledged co-operation to the government in the national defence program.

In Britain, advertising continued in considerable volume for products not greatly affected by government restrictions and which had "relief" and "escape" appeals, such as cigarettes, soap, liquors, cosmetics, beauty preparations, household aids and sweets. Advertising agency and publication offices were decentralized into units in different sections, so that if one were bombed, activities could go on in the others. Most newspapers and magazines continued and the war gave added interest to magazines of picture type. All available advertising media were put to use, due to the newsprint shortage. Export advertising took on new significance because of the government drive for foreign exchange. The *Hansard*, official publication of the British parliament, carried advertising for the first time to publicize war bond sales. The British government made wide use of newspapers, magazines, posters, billboards, films and radio in its efforts for recruiting, air-raid precaution work, food conservation, war financing and maintaining morale. Government programs were handled through British advertising agencies.

United States Army Advertising.—An appropriation of $250,000 was made for an army recruiting program principally in newspapers. The army recruiting publicity bureau turned out posters, carcards and other publicity at the rate of 13 tons a month for distribution to 550 recruiting stations and substations. Eighteen mobile recruiting stations also distributed this material. More than 750 radio stations carried daily recruiting announcements, in addition to special dramatizations. All movie companies co-operated with at least one short devoted to recruiting or preparedness. The war department asked 100 trade associations to devote space to the recruiting drive. Local recruiting officers persuaded retailers to include appeals in their advertising.

Contests and Premiums.—These advertising adjuncts continued their popularity in 1940. On one major network, approximately 52% of the commercially sponsored programs featured inducements of various kinds. (*See* also PSYCHOLOGY, APPLIED; RADIO, INDUSTRIAL ASPECTS OF; RADIO, SCIENTIFIC DEVELOPMENTS OF.)

BIBLIOGRAPHY.—Among the 1940 books on advertising and related subjects were: Business Publications, Ltd., *Advertisers' Annual, 1940* (London); *Art Directors' 18th Annual of Advertising Art;* W. C. Briggs, *The Camera in Advertising;* F. A. Burt, *Successful Advertisements and How to Write Them;* Harwood L. Childs, *An Introduction to Public Opinion;* Paul Carlyle and Guy Oring, text by Herbert S. Richland, *Design and Decoration to Make Advertising More Beautiful;* F. Egner and L. R. Walter, *Direct Mail Advertising and Selling;* J. Fowle-Fromings, *Technique of Advertising;* Kenneth Goode, *Ten Points for Advertisers;* E. Evalyn Grumbine, *Patsy Breaks into Advertising;* E. Hamburger, *It's a Woman's Business;* E. C. Hastings, *Retail Advertising;* J. M. Higginson, *Practical Advertising Management;* G. B. Hotchkiss, *Outline of Advertising*, revised; R. P. Hymers and Leonard Sharpe, *The Technique and Practice of Advertising Art;* Stephens College, Institute for Consumer Education, *Making Consumer Education Effective;* James A. Mangan, *Design, The New Grammar of Advertising;* W. C. and H. S. Pryor, *Let's Look at Advertising;* H. E. Stephenson and C. McNaught, *Story of Advertising in Canada; Advertising and Publishing Production Yearbook, 1940;* Bureau of Advertising, American Association of Newspaper Publishers, *The Newspaper as a Medium.* (D. ST.)

Aerial Photography: *see* PHOTOGRAPHY.

Afghanistan. A Muslim kingdom lying between India and Persia; area 250,000 sq.mi.; pop. (est. 1937) 10,000,000; chief towns: Kabul (80,000), Kandahar (60,000), Herat (50,000), Mazar-i-Sharif (30,000). Ruler: Muhammad Zahir Shah; languages: Persian, Pushtu, and some Turki in the north; religion: Mohammedan.

History.—Peace and progress were maintained during 1940, the 21st year of Afghan independence, but when the king reiterated, in August, his declaration of neutrality, he stressed the necessity of being prepared and united in view of current external events. Toward this end obligatory national service for all males over 17 had been decreed in January, and special taxation imposed for the purchase of arms from abroad and the construction of two radio stations and three railway lines.

A trade agreement with the U.S.S.R. was signed in July, under which Afghanistan exchanges wool, casings, skins and herbs against textiles, salt, sugar and kerosene; while internal economic development was furthered by increasing the availability of land

for cultivation, by assistance to the sugar-beet industry, and by official sanction of a scheme for the formation of a joint-stock company to co-ordinate the work of the country's cotton pressing, spinning and weaving factories. Archaeology benefited by the discovery early in the year of the long-buried city of Begran, the ancient capital at the time of the Greek domination, by the French research expedition (withdrawn in July) under Professor Josef Hackin.

Education.—Confined chiefly to Kabul. Elementary schools exist throughout the country, but secondary schools exist only in Kabul and provincial capitals. Both are free. There were in 1940 130 primary schools and one normal school for teachers in Kabul. In addition there were 4 secondary schools and 13 military schools. Technical, art, commercial and medical schools exist for higher education. The Kabul university was established in 1932; only a medical faculty existed in 1940.

Army.—Compulsory service; peace strength 60,000.

Finance.—Revenue and expenditure about Rs. (Afghan) 150,000,000; currency: Rs. 3.95 (Afghan) = Rs. 1 (Indian). Rs. 1 (Afghan) = 5*d.* approximately.

BIBLIOGRAPHY.—Sir Percy Sykes, *A History of Afghanistan*, 2 vols. (1940).

A. F. of L.: *see* AMERICAN FEDERATION OF LABOR.

Africa, British East: *see* BRITISH EAST AFRICA.

Africa, British South: *see* BRITISH SOUTH AFRICAN PROTECTORATES.

Africa, British West: *see* BRITISH WEST AFRICA.

Africa, French Equatorial: *see* FRENCH COLONIAL EMPIRE.

Africa, French West: *see* FRENCH COLONIAL EMPIRE.

Africa, Italian East: *see* ITALIAN COLONIAL EMPIRE.

Africa, Portuguese East and West: *see* PORTUGUESE COLONIAL EMPIRE.

Africa, South-West: *see* SOUTH AFRICA, THE UNION OF.

Africa, Spanish West: *see* SPANISH COLONIAL EMPIRE.

Africa, Union of South: *see* SOUTH AFRICA, THE UNION OF.

Agricultural Chemistry and Engineering, U.S. Bureau of: *see* CHEMISTRY AND ENGINEERING, AGRICULTURAL, U.S. BUREAU OF.

Agricultural Machinery: *see* FARM MACHINERY.

Agriculture.

The Food Crop Situation.—The year 1940 in the U.S. was a very good crop year. The index of yields of 28 crops was 18·5% above normal, the highest in history. In fact, the United States has had good crop yields for the last four years. Corn is the most important grain crop of the U.S. Based on the December estimate, the United States yield was 28·3 bu. per acre for 1940 (Table I). This was less than the unusually good 1939 crop, 29·4 bu. per acre. There have been

Table I.—Crop Yields per Acre in the United States

Crop	1937	1938	1939	1940*	Four consecutive years of 1937–40	Low yield, '30s, 1933–36	High yield, early '20s, 1920–23	High yield in 1912–15
Corn, all, bu.	28.3	27.8	29.4	28.3	28.5	19.7	28.5	26.4
Wheat, all, bu.	13.6	13.3	14.1	15.3	14.1	12.1	13.3	15.6
Oats, bu.	32.9	30.0	28.4	35.5	31.7	23.0	29.0	32.5
Barley, bu.	22.1	24.1	21.7	23.1	22.8	18.6	21.8	24.6
Rye, bu.	13.0	13.8	10.2	12.7	12.4	10.2	12.9	13.5
Buckwheat, bu.	15.9	14.8	15.2	16.2	15.5	17.3	17.1	16.5
Flaxseed, bu.	7.6	8.7	9.0	9.6	8.7	5.6	7.9	8.9
Rice, bu.	49.1	48.8	51.7	50.2	50.0	48.6	39.3	35.5
Grain sorghums, bu.	13.1	12.9	10.3	12.3	12.2	8.9	16.7	..
Hay, all tame, tons	1.34	1.42	1.30	1.40	1.37	1.17	1.31	1.34
Beans, dry, lb.	917	925	882	876	900	749	698	..
Potatoes, bu.	124.1	123.8	120.3	130.3	124.6	107.7	104.3	104.4
Index of 28 crops	117.7	113.1	113.8	118.5	115.8	90.2	100.9	..

*Based on the December estimate.

four consecutive years of good corn yields, averaging 28·5 bu. per acre. This is the same as the best four consecutive years of the early '20s, 28·5 bushels.

The average yields since 1936 for wheat, oats and barley were better than in the best four consecutive years of the early '20s but slightly less than the good yields of the four consecutive years 1912–15. Hay yields were about the best in history.

Acreage and Production.—Since 1936, acreage of 46 crops harvested in the United States totalled 334,000,000 ac. This is about 5% less than in the early '20s. During this time, population increased 20%.

As a result of changing acreage and yields, the production of corn, oats, rye and buckwheat in the late '30s was less than in the early '20s; whereas the production of wheat, barley, flaxseed, rice, hay, beans, potatoes and soybeans was somewhat greater.

The production of 22 field crops increased from an index of 98·2 in the early '20s to 104·1 in the last four years (Table II). When fruits and vegetables were added to the field crops, the

Table II.—Crop Production in the United States
(million bushels)

Crop	1937	1938	1939	1940‡
Corn, all	2,651	2,562	2,602	2,449
Wheat, all	876	932	751	817
Oats	1,162	1,068	936	1,236
Barley	220	253	275	309
Rye	50	56	39	41
Buckwheat	6.8	6.7	5.7	6.4
Flaxseed	7.1	8.2	20	31
Rice	53	53	54	53
Grain sorghums	98	99	83	121
Hay, all tame*	73	81	76	86
Beans†	16	15	14	16
Potatoes	395	374	363	398
Index				
22 crops	109.9	102.3	99.8	104.5
53 crops	112.6	105.5	103.9	107.9

‡Based on December estimate. *Million tons. †Million bags of 100 lb.

index of production increased from 96·2 to 107·5. Stated another way, the production of 22 field crops increased 6%; and of 53 crops, 12%. During this time, the production of six grain crops declined about 10%; and population increased 20%.

Livestock, a Shock Absorber.—During the last four good crop years, there has been an accumulation of stocks of wheat and corn.

Normally, following good crop years, stocks of food accumulate in the form of more animals and/or heavier animals, more dressed meats in cold storage and some surplus grain and hay carried over into the next years. In poor crop years, animals are liquidated and/or become smaller, and cold storage holdings and surplus feeds disappear. In this way, farmers have always assured the public of a reasonably stable food supply.

This was well illustrated during the dry years of the early '30s. There was not sufficient grain for both man and beast. Food was

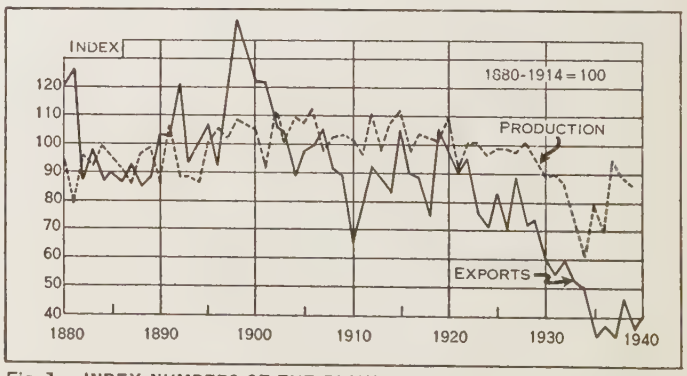


Fig. 1.—INDEX NUMBERS OF THE PHYSICAL VOLUME OF CROP PRODUCTION PER CAPITA AND OF TOTAL AGRICULTURAL EXPORTS OF THE UNITED STATES, 1880–1940. From 1880 to about 1915, there was a tendency for the production of crops per capita to increase slightly. Since that time, they have declined. The physical volume of exports rose to about the turn of the century. Thereafter, a decline set in and continued to 1940. The only interruption was during and immediately following the war of 1914–18

"TO BE CONSIDERED with crop-control" in 1940, by Temple in the *New Orleans Times-Picayune*

made available by reducing inventories of grain and hay and livestock, and by feeding less to the livestock remaining. The amount of food made available to the consumer through liquidation of inventories was greater than the grain saved by the decline in meat production caused by the decreased rate of feeding.

Conversely, during the last four good crop years, surplus hay, grain and pasture were stored in the form of more animals and heavier animals. During this period, the farm stocks of sheep, hogs, cattle and chickens have increased. Farmers have also reestablished their normal stocks of grain. Under normal conditions, most of these extra accumulations of feeds would have found their way into still more and/or heavier livestock.

In times of war, large stocks of food in the form of many animals of heavy weights on the hoof and in cold storage warehouses are much more valuable than corn in the crib and hay in the mow. A soldier consumes more food and much more meat than a civilian.

Foreign Trade and Agriculture.—The two decades of falling prices since the war of 1914–18 played havoc with economic, social and political relationships between man and man, state and state, and nation and nation. Such a great collapse in commodity prices called for an explanation. Some persons turned to money; others, to overproduction; and still others, to the U.S. foreign trade policy. Many persons believe that the low level of farm prices was due to the loss of the foreign market.

From 1880 to about 1915, there was a gradual increase in the physical volume of crops produced per capita in the United States. Since the war of 1914–18, there has been a steady decline (fig. 1). Prior to 1900, U.S. agricultural exports fluctuated about production. Beginning about 1900 and particularly since 1920, agricultural exports have declined at a rapid rate and in 1940 were relatively unimportant.

Importance of the Export Market.—In the case of tobacco and cotton, the foreign market is important. However, the importance of the export market to U.S. food producers is generally overemphasized. In 1885, exports of food represented 6·7% of the total income that farmers derived from sales of food. Fifty years later, 1935, this proportion declined only 1·8%. This is well illustrated by analyzing the production, consumption and exports of a few crops and of meats.

Production, Consumption and Exports of Beef and Wheat.—Since the turn of the century, there has been a pronounced decline in the per-capita production of beef (Table III). Production has declined from about 75 lb. to about 50 pounds. Consumption also declined, but not so rapidly as production. Consequently, during that period, net exports disappeared and for about 15 years the United States has been importing beef.

Table III.—*Production, Consumption and Exports of Beef, U.S., 1899–1938*
(pounds per capita)

Five-year period	Production	Consumption	Net exports*	Per cent exported
1899–1903	74.1	67.5	5.3	7
1904–08	75.6	70.6	4.3	6
1909–13	69.6	68.3	1.1	2
1914–18	66.4	62.8	1.9	3
1919–23	59.9	59.1	1.0	2
1924–28	56.7	56.9	—2.3	—4
1929–33	48.3	48.9	—0.4	—0.8
1934–38	54.1	55.2	—0.5	—0.9

*Not including live cattle.

Formerly the United States produced about 8 bu. of wheat per capita and produced in 1940 about 5 or 6 bu. (Table IV). With consumption reasonably stable, exports declined. Formerly, exports of wheat represented about a quarter of the crop and were in 1940 negligible. With the tendency for the population to increase faster than production, it seems reasonable to assume that the United States will only export wheat in very large crop years.

Table IV.—*Production, Consumption and Exports of Wheat, U.S., 1914–38*
(bushels per capita)

Five-year period	Production	Consumption	Net exports	Per cent of crop exported
1914–1918	8.1	6.0	2.3	28
1919–23	7.8	5.6	2.1	27
1924–28	7.1	5.4	1.5	21
1929–33	6.4	5.6	0.7	11
1934–38	5.6	5.3	0.3	5

The production of pork has declined from about 80 lb. to about 60 lb. (Table V). With consumption reasonably stable, exports have declined from about 13% of production to practically nothing.

Table V.—*Production, Consumption and Exports of Pork, U.S., 1899–1938*
(pounds per capita)

Five-year period	Production	Consumption	Net exports	Per cent exported
1899–1903	79.8	69.8	10.4	13
1904–08	80.1	72.5	7.4	9
1909–13	71.3	66.5	4.6	6
1914–18	75.5	64.8	8.5	11
1919–23	76.5	66.6	10.0	13
1924–28	73.3	69.2	4.3	6
1929–33	71.2	69.1	1.7	2
1934–38	56.7	56.1	0.5	0.9

The same general situation is typical of many other food products. The United States has lost its export market for food because there is no surplus to sell—and not, as is generally assumed, because of some foreign or domestic policy.

Food Imports.—Prior to 1923, the United States generally produced more foods than it consumed and some were exported. The relative importance of food exports began to decline about 1900 and, just prior to the war of 1914–18, was negligible. This downward trend was interrupted by the war of 1914–18. However, since 1923, total food production has been less than consumption and increasing net imports have prevailed (fig. 2).

During 1936, net imports of food amounted to 5% of production. Barring wars, there is little likelihood that, in the future, the United States will export much food. On the other hand, food imports are likely to increase.

Possible Food Exports During War.—The failure of U.S. food production to increase with population since 1920 resulted in a decrease in exports and an increase in imports. In view of these facts and the world situation of 1940, the question naturally arises as to whether the United States could suddenly meet an increased demand for food.

During the last four good crop years, United States food imports exceeded food exports. For exports to exceed imports, it would be necessary to increase production about 3% above the last four good crop years. To export the 1916–18 quantities of food would mean a 7% increase in food production. But suddenly to increase food production 7% above that of the last four good crop years would be practically impossible.

If the United States is called on for such exports, they will not come from huge food surpluses that are assumed to exist, or from increased production, but from decreased food consumption in the U.S.A. (F. A. Pe.)

Agricultural Planning.—Organized planning for agriculture took on added significance during 1940. The changes that occurred in world conditions placed U.S. agriculture in a new economic environment. It became evident that the effects of the European war would assume increased importance in the determination of policies, and that significant changes in agricultural programs might be needed.

With a view to guiding such changes as effectively as possible without sacrificing democratic ideals, agricultural planning in 1940 was featured by an intensification of the co-operative land-use planning work begun in 1938 under the joint leadership of the department of agriculture and the land-grant colleges. This work is carried on through community, county and state land-use planning committees composed of farm men and women, agricultural technicians, and administrative officials of public agencies. These committees provide a means whereby all persons directly interested in agriculture may combine their knowledge and judgment, and may share responsibility in the development of policies to guide agricultural plans and programs.

Under the stimulus of increased responsibility, and with the benefits of the experience gained in 1938 and 1939, the land-use planning work progressed rapidly during 1940. Previously, the work had been restricted largely to the gathering of information concerning the conditions and problems in various areas as a necessary step toward the development of sound plans for action. During 1940, however, the work developed in many counties to the point where specific local plans for action, formulated by land-use planning committees, were being carried out either by co-operating groups of farm people or by administrators of the various federal and state agricultural programs. At the same time, the influence of land-use planning work was extended beyond the locality. Whereas tangible results were formerly restricted almost wholly to local adjustments in the operation of agricultural programs, accomplishments in 1940 included important changes in national programs.

The improvement in the operation of state land-use planning committees was an outstanding feature of the progress made during 1940. Many of the members of state committees travel long distances to attend the meetings, and, as a result, meetings have been relatively infrequent. This, together with the fact that the problems considered by these committees are more complex than those studied at the county and community levels, has made their work more difficult. However, the state committees met more frequently in 1940 and developed procedures which should enable them to utilize more effectively the services of technicians in bringing together the information needed in their work. (B. W. A.)

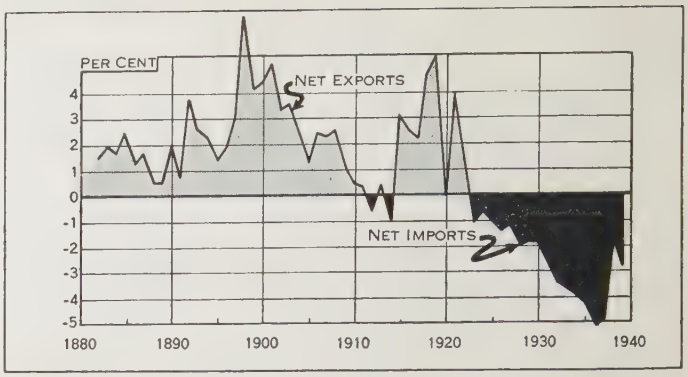


Fig. 2.—VALUE OF NET U.S. EXPORTS OR IMPORTS OF FOOD IN PER CENT OF FARM INCOME, 1882–1939. From about 1890 to about 1900, net exports mounted relative to production. From 1900 to the war in 1914, the excess of exports vanished. During the war of 1914–18, there was an excess of exports of food. Since 1923, imports of food have exceeded exports; and in 1936, were 5% of farm income. Even after four relatively good crop years, about 2% more food was consumed than produced

Great Britain.—A general plan for the reorganization of British farming in the event of war had been prepared in advance. This plan envisaged a general intensification of food production by such measures as improved drainage, better tillage and the use of more fertilizers; a reduction in the output of costly luxury foods (prime beef, lamb, eggs, etc.); and an increase in the production of crops that give high yields of nutrients per acre—cereals, potatoes and vegetables. Dairy herds were singled out for preferential consideration.

By Jan. 1940, through the agency of the County War Agricultural committees, the first stage of the plan had been applied throughout the country. The main object of the 1940 program was the conversion of 2,000,000 ac. of grassland to arable crops. The selection of the fields had mostly been made before the turn of the year. There had, however, been some delay in securing the necessary tractors and implements, and the autumn of 1939 had been unfavourable for wheat sowing. By the time the equipment was at hand (much having been bought from America) the soil was frostbound. When the frost eventually broke, in early March, it seemed that the fulfilment of the season's program had become impossible.

A dry spring followed the hard winter, however, and unprecedentedly rapid progress was made with spring tillage and seeding. Excellent tilths were made even out of tough sod and stubborn clay soil. Some of the seed went late into the ground but very little was ill sown, and the 2,000,000 ac. program was completed with something to spare.

In southeastern England the early summer was too dry for pastures and meadows, and also for arable crops on the lighter soils, but taking the country as a whole, there were excellent crops of wheat, potatoes and sugar beets, and no important crop was worse than middling. Moreover the hay, though the yield was light in places, was secured under good conditions; and the fine hay season was followed by a perfect corn harvest.

Rain came too late in the south and east to produce much autumn growth. The scarcity of grass was reflected in a reduced milk supply during October and November. Meanwhile the plows were at work again upon a further 2,000,000 ac. of grassland for the harvest of 1941. Autumn conditions were favourable for wheat sowing and a large increase in the wheat area was achieved. Supplies of fertilizers were well maintained.

It had been foreseen that normal imports of feeding stuffs for livestock—nearly 25% of the total food requirements of British herds—would not be available in time of war. It was clear that

BRITISH FARMERS plowed at night in the spring of 1940 to cultivate 2,000,000 new acres for wartime food supplies

these herds would have to be reduced and that pigs and poultry should be sacrificed first, since these animals live on grain rather than on grass. Before the end of the year the government decided upon a livestock rationing scheme as a means of enforcing the necessary reduction. Under this scheme, which was brought into force in Feb. 1941, pig and poultry keepers were allowed only one-third of their prewar feeding stuff supplies.

The Empire.—While the home farmer was faced with the problem of producing more food with smaller resources in the way of imported raw materials, the farmer in the dominions was faced with a difficulty of quite another kind—that of disposing of his produce. Canada grew an embarrassingly large crop of wheat and her farmers had to turn pig-keepers in order to "condense" their surplus wheat into bacon. The long haul from Australia and New Zealand made it essential that these countries should turn to still more highly condensed products; butter, cheese and milk powder continued to be worth their ship-room, but meat exports had to be curtailed and little fresh fruit could be shipped. In general, of course, considerable quantities of perishable food outside the war zone were going to waste and large surpluses of non-perishable materials—wheat, maize, oil-seeds, canned foods and even dried fruits—were piling up. Storage space was inadequate. (J. A. S. W.)

For agricultural statistics of countries other than the U.S.A. *see* the subheading *Agriculture* in the articles on those countries, also the articles on various crops and agricultural products. (*See* also ALFALFA; CHEMURGY; CORN; DROUGHT; DRY FARMING; DUST STORMS; FARM INCOME; FARM MACHINERY; FARM MORTGAGES; FERTILIZERS; HAY; HORSES; IRRIGATION; LAW (CASE): *Agriculture*; OATS; PRICES; WHEAT; etc.)

Air Conditioning.

Stimulated by favourable business conditions, the sales volume of the industry showed in 1940 about a 30% increase over 1939. The United States continued to be the world centre of air conditioning activity, although South America and the West Indies were active. Apparently an air conditioning consciousness is being awakened in certain of the countries at war, through the necessary conditioning of the air in certain bombproof shelters.

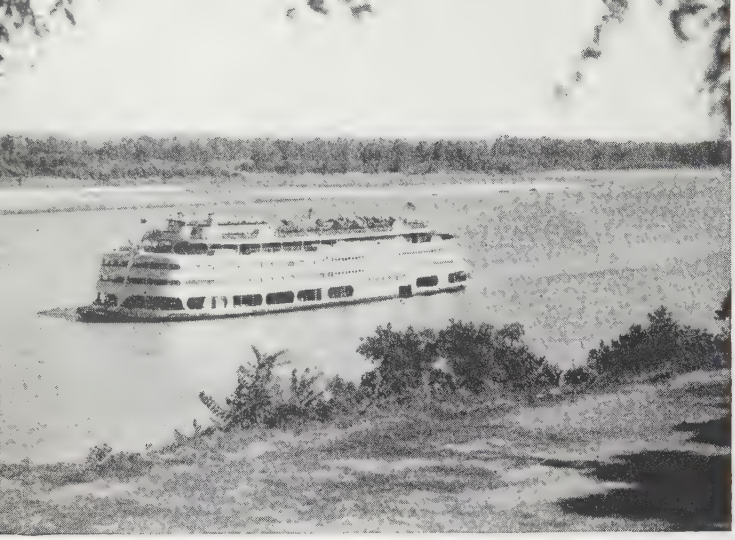
Air Conditioning Technique.—There were no new and radical developments in the art of air conditioning during 1940. However, the year was marked by a definite further advance in the packaging of equipment, in order to simplify the installation problem. A healthy increase occurred in the sale of room coolers of the self-contained or package type. The designs were relatively simpler to install than those of 1939 and more sightly in appearance, as well as less likely to give trouble. Each of these little units has from one-third to three-quarters of a ton of cooling capacity (one ton of cooling capacity is equivalent in cooling effect to the melting of one ton of ice in 24 hours), and one unit of proper capacity will handle the average single office, bedroom or living room.

Also in 1940 there was a noticeable slackening of central plant activity in the smaller capacities, such installations more preferably going to the unit conditioner or "store cooler" as it is called. Such units were available up to 10 tons' cooling capacity, complete with built-in automatic control and special air diffusion heads of such design that the pattern of the delivered air may be adjusted to exactly fit the conditioned space, to give even and relatively draughtless air distribution. Thus it is possible for the owner of the small shop, restaurant or theatre to obtain the benefits of air conditioning at a relatively small investment and in most cases without the use of cumbersome and expensive built-in features, such as duct systems.

A noticeable increase in the acceptance of winter air conditioning as a part of better living, developed during 1940. Package cooling equipment, such as the room coolers and store coolers mentioned above, was in many instances made available for winter circulation and filtering of air as well as ventilation. The larger store coolers are often installed with heating and humidifying accessories, to give year 'round air conditioning.

The sale of automatic winter air conditioning equipment for homes increased tremendously during 1940. A large proportion of all the new homes built, particularly in the medium price brackets, used winter air conditioning systems.

Physiological Benefits.—The investigation and development of the benefits of air conditioning to health, continued, particularly with regard to reducing the bacteria count in the conditioned air. For example, it has been shown that a proper filtering of the air will at the same time reduce the bacteria in the air,



AN AIR-CONDITIONING SYSTEM with a cooling capacity equal to that of the "Queen Mary" is installed on the streamlined Mississippi river excursion boat "Admiral" which went into service in the summer of 1940

thus tending to avoid bacterial concentrations which would be greater than normal body immunity could successfully combat. It is well established that air conditioning usually provides relief for sufferers from hay fever and pollen asthma. (*See* also PUBLIC HEALTH ENGINEERING.) (EL. HA.)

Aircraft Carriers: *see* AIR FORCES: *Navy;* NAVIES OF THE WORLD.

Air Forces. **Army.**—The year 1940 marked the further expansion of the United States army air corps. In 1909, the Wright brothers had delivered to the United States Army the world's first military aeroplane. In 1939, on the 30th anniversary of the event, was inaugurated the greatest peacetime expansion of the air corps in the history of the United States. Congress authorized and appropriated $302,000,000 for the purpose. In 1940 congress authorized and appropriated $2,385,668,570 (including the 3rd Deficiency bill of Oct. 8, 1940) for further expansion.

The program for the fiscal year 1940 called for 5,500 aeroplanes, 11 air bases, 8 bombardment groups, 5 pursuit groups, 6 reconnaissance squadrons and approximately 9,500 officers and 95,000 enlisted men.

The 1941 fiscal year program called for a tremendous increase. More than 18,000 additional planes had to be ordered and the strength of the air corps brought to a total of approximately 16,000 officers and 160,000 enlisted men. Sufficient new bases were needed to house an increased G.H.Q. air force consisting of 54 groups. By the fall of 1940 orders for the aircraft had been placed, the rate of personnel procurement and training greatly increased, and approximately 50 new bases selected with more to be chosen.

The groundwork for training of personnel was laid in 1939 under the 1940 program when nine established civilian flying schools and seven civilian mechanic schools were selected for training air corps personnel. In 1940 the number of civilian flying schools was increased to a total of 18 and the total capacity tripled. This necessitated the establishment of two new air corps training centres, one at Maxwell field, Ala., and the other at Moffett field, Calif. The civilian mechanic and technical training schools were increased to 14. In addition, training facilities at the three air corps technical schools, Chanute field, Rantoul, Ill.; Lowry field, Denver, Colo. and Scott field, Belleville, Ill., were increased to handle a larger volume of students. In addition to these schools a school for navigators was opened at Miami, Fla., with another to be opened at Barksdale field on Feb. 15, 1941. A school for the training of bombardiers was also to be opened at Barksdale field on the same date.

As the calendar year 1940 closed, pilots were being trained at the rate of 12,000 a year and technicians at the rate of 53,000 a year. When the bombardier and navigator schools opened they would be equipped to train these men at the rate of 3,500 a year. (*See* also ARMIES OF THE WORLD.) (H. H. A.)

Navy.—The bureau of aeronautics, during the fiscal year 1940, continued, and accelerated wherever possible, the development, procurement and maintenance of aircraft in accordance with the requirements of the navy. When this procurement of aircraft was authorized by the congress, the navy was fortunately in a position to undertake the expansion without reducing the quality of the aircraft. Shore facilities to support the operating aircraft continued to be developed under the broad program laid down by the Hepburn board. On the recommendations of this board, the 76th congress had authorized funds for initial construction.

Eighteen aircraft carriers were, in 1940, either on hand, under construction or authorized. Those in commission were, in 1940, the "Saratoga," "Lexington," "Ranger," "Yorktown," "Enterprise" and "Wasp." Those under construction were the "Hornet," "Essex," "Bon Homme Richard," "Intrepid" and "Kearsarge."

During the fiscal year 1940, approximately 1,300 aeroplanes were ordered to replace those in service which became obsolete or which had been lost due to crashes, as well as to increase the naval aeronautical organization in accordance with the Naval Expansion act. At the end of the fiscal year, June 30, 1940, the navy had on hand approximately 2,200 aeroplanes.

All combatant ships of the navy, with the exception of destroyers and submarines, carry their own complements of aeroplanes, varying in number from 2 to 3 on the battleships to approximately 75 on each of the aircraft carriers. The types of aircraft are determined by the missions of the surface ships to which they are attached.

MAJ. GEN. ARNOLD of the U.S. army air corps described this Lockheed interceptor as "the world's fastest" when he released its performance statistics for the first time Aug. 22, 1940. Its top speed exceeds 500 m.p.h.

The requirements for carrying out these missions have brought into being aeroplanes possessing mechanical features and capabilities that differ greatly from aeroplanes operated by land-based military forces and by commercial aviation establishments. Continuous efforts were being made in 1940 to keep at a minimum the number of types by designing each type to perform the maximum number of functions. The following is a brief description of these basic types:

(a) The fighting plane represents the maximum in performance, manoeuvrability and gunnery; is small and high-powered; and its primary mission is that of attacking enemy aircraft with gunfire.

(b) The torpedo and bombing planes, the largest type employed on the carriers, are designed to attack enemy heavy vessels or shore bases. An important type under this classification is the dive-bomber, which, as its name suggests, delivers its attack in a vertical or near-vertical dive on its objective, either ashore or afloat.

(c) The scouting and observation planes require speed, range, good gunnery defence and excellent facilities for radio in order to accomplish

their missions of scouting for the cruisers and carriers and observing for the battleships.

(d) The patrol plane is the largest type in service in the navy, its size being necessitated by the fact that the craft must be capable of great range, be seaworthy, and be sufficiently habitable to permit operating for protracted periods independent of its base. In addition, the patrol plane must be self-protecting while carrying out long-range strategic scouting flights, and must be capable of joining the fleet at any time.

Development has been pressed on improved engines in order to obtain greater power, better installations from an aerodynamic standpoint, and more efficient performance with safer fuels. The necessary equipment was in 1940 being actively developed to take full advantage of increasing ranges, altitude and other aircraft performance, and to promote the general efficiency of naval aircraft. (J. H. Ts.)

The World.[1]—On Jan. 1, 1940 the European war which began in 1939 was already four months old. Contrary to prediction, a "total" air war had failed to materialize. Except during Germany's drive against Poland, none of the combatants had employed his air force at anywhere near full strength. None seemed willing to show his hand. Each played a waiting game, sizing up the strength of the opposition, meanwhile pushing factories and training centres to the limit to produce new planes and new pilots. As for any positive evaluation of the aeroplane as a weapon in modern war, the year 1939 ended on an interrogation point. Questions debated by air strategists for a decade had not yet found answers. No conclusive data had come out of prior experience in China, in Ethiopia, in Spain, or even in Poland. Nowhere, up to that time, had opponents of near-equal air strength come to grips.

The Douhet theory still provided subject for argument. Over 15 years before, this Italian general had postulated that great masses of bombers flying in close formation for mutual protection could successfully attack cities and industrial areas far behind front lines, could break down an enemy nation's will to resist by destroying its sources of supply and by terrorizing whole populations. But whether Douhet was right or wrong was not proven by the events of the fall of 1939.

Then, too, there was the perennial problem of aeroplane versus battleship. No one had any notion as to how effective air power might be in blockading seaports or in disrupting ocean-borne commerce. Also, as yet untried were defensive measures against massed air attack and the elaborate systems that had been planned for protecting civilians against bombardment. As 1940 closed, however, enough theory had been put into practice to yield some indication as to what would be written down when the books on air strategy and tactics of the European war are finally written.

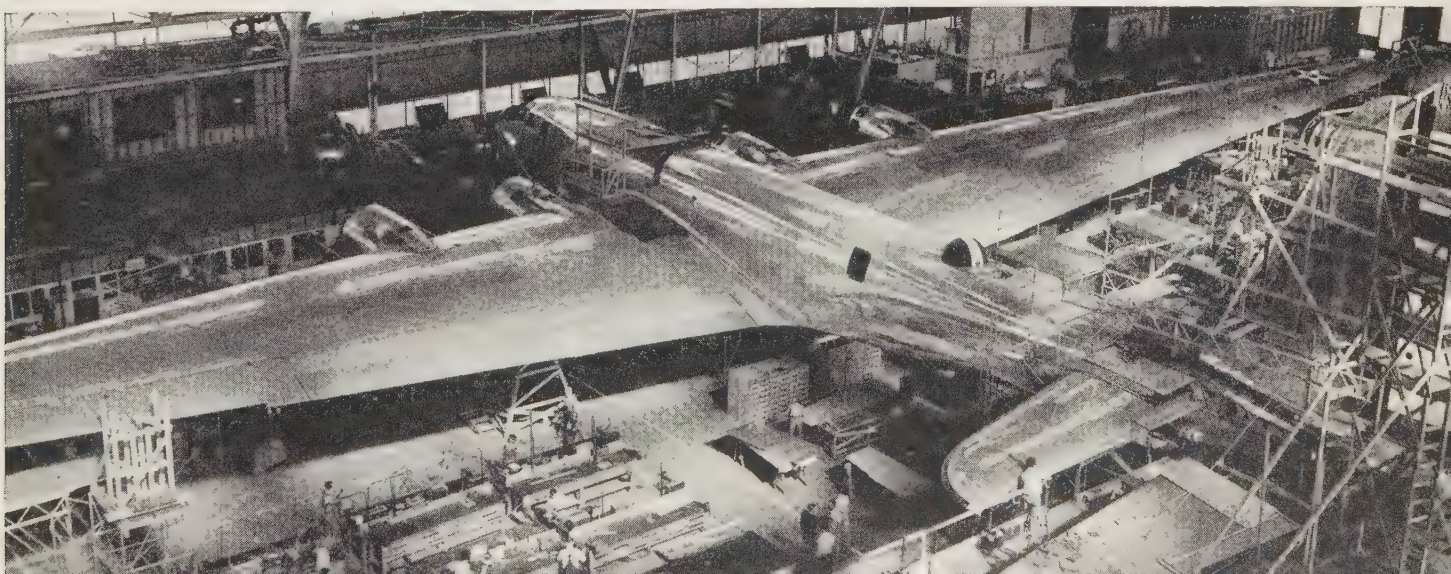
In the first place, the Douhet theory appears to be at least partially sound. It seems to work in cases where air superiority on one side is overwhelming. Russia employed it successfully against Finland early in 1940. Germany cleared the way for her swift moving ground divisions in Poland, in Norway and in the Low Countries by blasting the opposition on the ground with hordes of bombers. With the wanton destruction of Rotterdam, Germany served notice as to what she could and would do.

When the final scores are added up, it will probably be clear that France was lost, not because of any lack of valour on the part of her front line troops and squadrons, but rather because her forces in the field were cut off from bases, from information and from needed supplies by the German *luftwaffe*. By constant hammering at aerodromes, factories, railheads and supply depots from the channel to the Mediterranean, French industrial and economic life was completely disrupted days before the final surrender. The French air force, weakened by the short-sighted policies of the French governments of the preceding five years, was powerless to resist, and at that stage Great Britain was in no position to give adequate aid in the air. It was only when the *luftwaffe* came up against the determined and desperate resistance of the British R.A.F. in defending its home territory that the Douhet theory began to break down. Germany soon found that big bomber formations were not mutually self-protective; that they must be covered by fighters in large numbers. And since the range of mixed bomber and fighter fleets is limited to that of the escorting pursuit planes (generally but a fraction of the range of most bombers), it became essential for Germany to secure bases in the north of France and in the Low Countries before she could hope to launch any extensive aerial attack against Great Britain. At that, the work of the British fighter squadrons became so effective by midsummer of 1940 that Germany had to abandon daylight raiding against Great Britain. The heavy damage that was effected in the London area and in the midlands during the latter part of 1940 was done almost entirely at night or in bad weather when the defending fighters had difficulty making contact with the enemy.

The final answer to the question of aeroplane versus battleship remained to be found. Both sides claimed destruction of capital ships at sea and in harbours by aerial bombardment. The early German raids against the Firth of Forth base cost Great Britain some fighting tonnage, and some damage was done to aircraft carriers and to battleships at sea. Late in the year, Great Britain succeeded in rendering a good half of Italy's

[1]All assertions or opinions contained in this section of this article are the private ones of the writer and are not to be construed as official or reflecting the views of any government service.

THE LARGEST BOMBER in the world received its finishing touches at Santa Monica, Calif., in 1940. It can take off with a gross weight of 164,000 lb. and fly nonstop from the United States to Europe and back



surface fleet *hors de combat* with a few squadrons of torpedo planes. Germany consistently and effectively attacked British convoys by bomber squadrons, some of them operating far out at sea. Just how much of Britain's merchant tonnage losses were due to aeroplane attack or to submarine attack is not definitely known. The German high command, however, claimed that since the French armistice in June 1940, the surface navy accounted for some 3,000,000 tons of shipping and the air force about 700,000 tons, or about one out of every four tons by aerial bombing. On the other hand, the aeroplane was proving an effective means of protecting shipping against air attack. At the end of 1940 Air Chief Marshal Sir Frederick Bowhill of the royal air force coastal command reported on the activities of his forces as follows: "More than 2,000 convoys, numbering 40,500 ships, totalling about 200,000,000 tons, were escorted by the coastal command. The value of inbound and outbound cargoes averaged about $16,000,000 daily. The command flew about 34,000,000 nautical miles during the year."

Protection from the ground against aerial attack has not been as effective as had been hoped. Both sides have been utilizing balloon barrages around cities and industrial areas. These consisted of strings of captive balloons anchored at various heights. Between each pair of balloons cables are stretched from which a network of lighter steel wires or cables is suspended. The cables are difficult to detect by attacking raiders. To strike such a network in full flight is almost always fatal to a fast aeroplane. Some observers claim that more German aircraft have been brought down by the balloon barrage than have been destroyed by anti-aircraft fire. Early in 1940, Great Britain claimed to have over 700 mi. of balloon barrage available. A great deal has been learned and put into practice about anti-aircraft artillery and fire control. The guns themselves have been improved since 1920, so that where the effective vertical range at the close of the war in 1918 was around 12,000 ft., modern anti-aircraft guns are good at 18,000 to 20,000 ft. London and other key cities of Great Britain are surrounded by thousands of anti-aircraft guns and searchlights, but they are not entirely effective as indicated by the almost nightly appearance of German squadrons over British cities.

So far, there seems to be no real protection against massed bombing attack at night or in bad weather from relatively short ranges, once the attackers have left the ground. It seems probable that the only effective way to combat such raids is to attack and destroy enemy aircraft on the ground, or to render untenable the bases from which they must operate. So far, however, Germany has been more successful in this regard than has Great Britain.

Most countries have experimented occasionally with the transport of ground troops by aeroplane, but no country has ever tried it out on such a scale as did Germany during 1940. Thousands of infantrymen were transported by air into Norway and into the Low Countries. Such transport of troops, however, presupposes the possession of landing fields in territory to be occupied. In order to seize such landing fields to prepare the way for invasion by air, Germany made effective use of a new style of attack and a new type of attacking unit—parachute squadrons.

Although the U.S. army air corps had suggested something of the sort years before, and although Russia had long since done considerable experimenting in that direction, the idea that large bodies of troops could invade enemy territory by parachute seemed too fantastic to warrant serious attention. Most military people believed that parachutists could be shot out of the air like clay pigeons, or disposed of easily once they reached the ground. Such, however, has not proved to be the case. Germany had secretly trained thousands of parachute troops, and many a key airport in Norway, Holland and Belgium got its first notice of invasion when the parachutists began to shower down.

Another idea of the same sort that has been widely discussed, but so far not carried into execution, is the use of glider transports for troops. In theory at least, infantrymen may be transported over enemy territory in large glider "trains" towed behind powered aeroplanes. The gliders will then be cut loose from the towing craft and will descend silently over a wide area. They may be landed safely in unprepared fields at strategic points. It has been rumoured that Germany has prepared such transport "glider trains" for the invasion of England, but none actually appeared in 1940.

Another unconventional tactic employed by the *luftwaffe* was the sowing of mines in British coastal waters by aeroplane. By the year's end, British defence units had this technique more or less under control, but during the early months of 1940 a considerable amount of British shipping was destroyed by mines laid at night by German seaplanes.

The experiences of the first year of the war in the air have brought out a number of new ideas with respect to fighting aircraft. In order to provide needed protection for long-range bomber flights, a new type of fighter has emerged. Heretofore the single seater was accepted as the best fighter, a hangover from 1918. As an interceptor for defensive purposes it was in 1940 still considered indispensable, but the twin-engine, multiplace fighter, or "destroyer" as the Germans have termed it, was rapidly proving its superiority. Germany has developed at least two effective machines of this kind, the Messerschmitt 110 and the Focke-Wulfe 187, ships that were in 1940 displacing the Me-109s that formed the backbone of the *luftwaffe* fighter squadrons up to the beginning of the battle for Britain. The Me-110 is a monoplane powered with two Daimler-Benz engines of 1,050 h.p. each. It carries a crew of two (a pilot and a gunner-navigator-radio operator). It is armed with two 20-mm. cannon and four 30-calibre machine guns. It is said to have a top speed of about 365 mi. an hour. The FW-187 is of the same general type. It carries the same crew and armament. A great deal of attention has been

TYPICAL GERMAN TACTICS in raiding southeastern England. *Left:* The Germans first dispatch planes over Tunbridge Wells to engage R.A.F. planes there and draw reinforcing planes from Sheerness. *Centre:* The next raid is over Dover. Dover planes as well as more from Sheerness rise to meet the attack. Sheerness, provided the stratagem works, has then been depleted of reserve planes. *Right:* The main attack is then directed at Sheerness, which must be defended by planes from other fields. Sometimes, however, these planes arrive too late for effective action

paid in both machines to providing heated cockpits and oxygen equipment for long-range flights at high altitudes. The manoeuvrability of these machines is reported as good as that of the smaller single seaters, but their effective range and fire power are many times greater. They are, perhaps, the most formidable fighting machines that have yet appeared.

As is generally the case, military design progress follows a zigzag course —one side or the other obtaining a temporary advantage, shortly followed by improvement of design by the other side. Thus the advantage held by the Me–109 in the early stages of the war was neutralized by improvements in Great Britain's Spitfires and Hurricanes. By the close of 1940, the Me–110s and FW–187s showed a slight edge on the British fighters. At the end of the year, however, new British types, said to be superior to the German destroyers were reported to be taking the air. The Boulton Paul Defiant with its two-man crew and four-gun powered turret has made an excellent showing against the improved German types. The latest Spitfire, built around the Rolls-Royce Merlin engine of 1,300 h.p., was said to have a speed of better than 390 mi. an hour and to carry 12 guns, including two 23-mm. cannon and two 50-calibre machine guns. A super-Spitfire, powered with the new Rolls-Royce Griffin engine of 1,600 h.p., was going into production in 1940. Two new Hawker types, improvements on the Hurricane, were known to be near completion. One of them, the Tornado, was said to be powered with a 2,000-h.p. Rolls-Royce Vulture engine (a 24-cylinder X motor based on the Merlin). Another type which was reported, but which was not seen in service in 1940, was the Westland Whirlwind, said to be powered with two Napier engines and to carry a great number of guns.

Germany, too, was known to be developing new and improved fighter types built around engines of high horsepower. Both Daimler-Benz and Junkers were known to have in production engines in the 2,000 h.p. range and they would likely appear in production aircraft in early 1941.

Bombers were also coming in for their share of development. The twin-engine medium type, such as the Heinkel 111, the Dornier Do–215, the Junkers Ju–88, the British Bristol, Blenheim and Beaufort, Handley-Page Hamptons and the American-built Bostons (Douglas DB–7) and Baltimores (Martin 187) were all undergoing steady improvement. Both the British and the Germans were in 1940 working on four-engine bombers of much larger size, machines comparable to the U.S. Boeing four-engine Flying Fortresses, some of which have been sold to Britain. Great Britain needed big bombers in 1940 in order that she might reach industrial centres many hundreds of miles inside German territory and in the north of Italy and to protect her convoys. Germany in 1940 had plenty of bombers of sufficient range to operate against British cities from bases on the mainland of Europe, but her main interest in long-range heavy bombers was for use far out at sea against Britain's merchant convoys. Stories were current of large machines capable of doing patrol duty at sea for as long as 36 hours at a stretch. During the latter months of 1940, Germany used her aircraft as an efficient auxiliary to her underseas fleet in her attempted blockade of Britain.

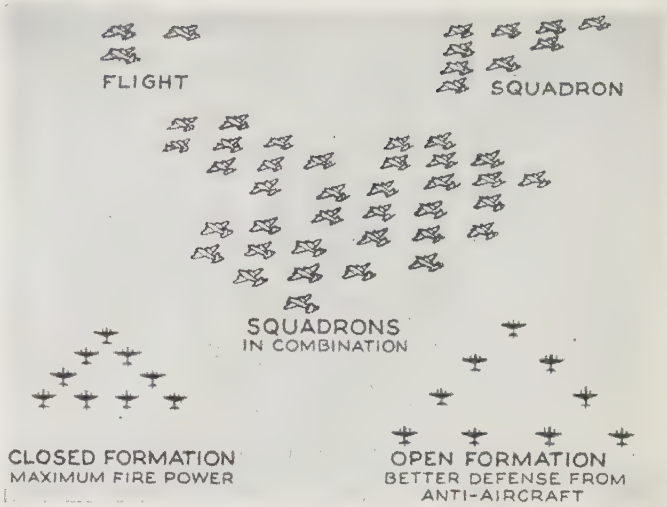
One of the most important lessons of the first year's active experience in modern air fighting was the realization that fire power and ability to absorb punishment are controlling factors. Where only a few years back two and three machine guns per aeroplane were considered ample, in 1940, six, eight and twelve guns, at least half of them 50-calibre, supplemented by at least one automatic quick-firing cannon, were considered indispensable. Spitfires, for example, carried eight to twelve machine guns, all fixed, all firing forward and all focused on a point ahead of the aeroplane. These guns fired at rates around 600 shots a minute. The chances for survival of an enemy pilot caught at point blank range in such a cone of fire were reasonably slim.

Besides the 30- and 50-calibre standard machine guns, the quick-firing 23-mm. aircraft cannon was rapidly coming into wide use. Such cannon were sometimes mounted in pairs, firing forward, as in the Me-110 and FW-187. They had a far more effective range than had any machine gun. They fired explosive shells that would detonate on contact with aeroplane fabric or on piercing any thin sheet metal. They might cause considerable damage over a wide area of wing or in engine nacelle, or in pilot's cockpit.

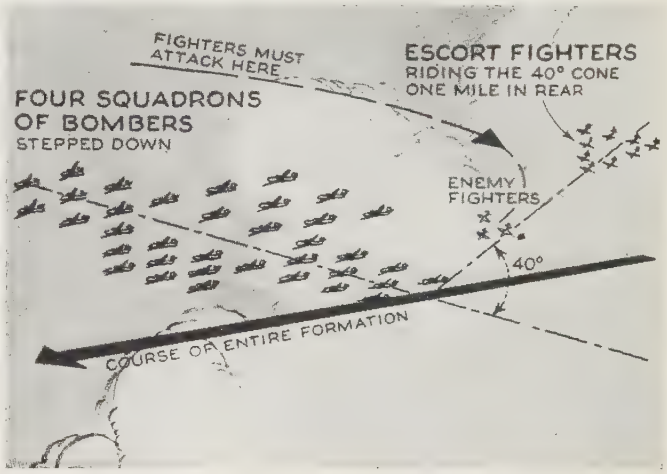
The rapid improvement in fire power accelerated tremendously the study of protective armour for all military aircraft. Up to the outbreak of the war, little real attention had been given to protecting the pilot or vital parts of the aircraft with armour plate. Aeroplane designers relied more on manoeuvrability and speed to avoid direct hits than they did on armour to absorb or to deflect missiles without material damage. Besides, armour is a dead loss as far as performance is concerned. The more weight that is put into armour, the less can be put into gasoline and the more the effective range is reduced. There seemed to be nothing that could be done in 1940, however, except to accept the fact that a sufficient amount of armour of some kind must be provided to protect the pilots and crews against anything but point-blank firing with heavy guns. A great deal of study was going into the problem of securing tough, lightweight steels and of disposing of them most effectively around pilot's and gunner's cockpits.

One of the important developments of this sort was in the leak-proof gasoline tank. It would obviously be of great military value if fuel tanks could be surrounded by something which could flow into and block off any kind of hole that might be made in a tank by gunfire. It would also reduce the hazard of fire and explosion from the penetration of fuel tanks by bullets. Much theoretical work and some experimentation had gone on in various countries since the close of the war in 1918, but Germany was the only country that entered the European war with large numbers of its fighter aircraft fitted with protected fuel tanks. The results were so conclusive that presently every country, including the U.S., began extensive research and development on tank protection.

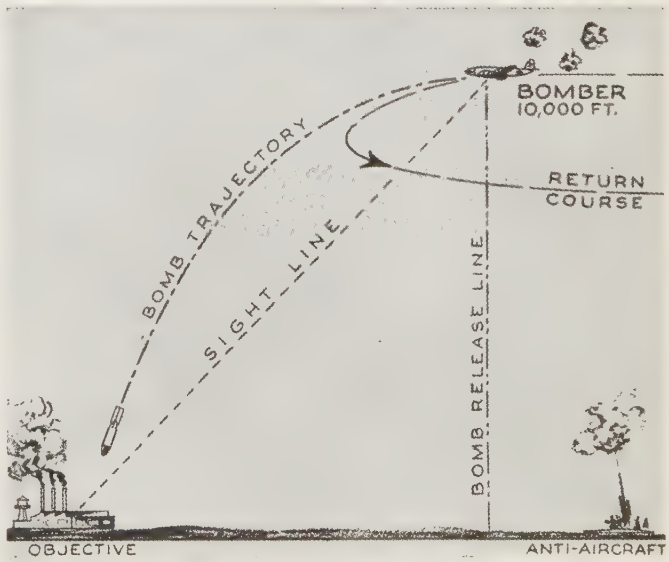
But in spite of the importance of superior performance, the ability to produce aeroplanes in large numbers will eventually determine the course of the European war. It is well known that Germany, at the outbreak of war in 1939, possessed almost twice the number of military machines as did France and Britain combined. Furthermore, her producing plants were probably capable of turning out at least twice as many units a



BOMBERS FLY IN FORMATION to shield their "blind spots" from fighters attacking in the rear. Closed formation is the best protection against fighters, open formation against anti-aircraft batteries



FORMATION FLYING does not afford complete protection for bombers. The squadrons are still vulnerable in a 40° cone behind the direction of flight. This exposed area must be covered by escort fighters



BOMB SIGHTS designate the correct point of release, taking both speed and altitude into account. Because even a fast bomber may turn tail before it reaches a point directly over the target, anti-aircraft guns must be spaced a considerable distance on all sides of the objective

month as were the combined factories of France and Great Britain. When the productive capacity in the United States became a factor in 1940, it seemed not impossible that within a relatively short time, say within a year and a half, the combined air forces of Great Britain and France would equal that of Germany. But the collapse of France not only made it necessary to subtract the French output from the combined total, but to add part of it to the German production figures. Most of the larger French aeroplane and engine manufacturing plants went into German hands with the surrender of France. British production under normal conditions was increasing steadily and satisfactorily. With the extensive damage done by the night bombings during the fall of 1940, however, it seemed probable that serious reductions had been made in British plant output capacity. This created a demand for accelerated output by U.S. factories. T. P. Wright (in *Aviation* for Jan. 1941) estimated that British aeroplane production, plus one-half the future U.S. aircraft output, would equal the total production of the axis powers by midsummer of 1941. It would be early summer of 1942, however, before the royal air force would be up to the strength of the air arms of the axis.

Although the British conducted extensive and continuous air raids against German industrial centres, it seemed likely that the interruption of aircraft production was far less in Germany than it was in England. German attackers must fly only short distances to get at British factories in the Midlands, whereas British bombers must fly long distances with relatively light bomb loads to reach Oranienberg, Dessau or Turin. The probabilities were that Germany could utilize far more of her installed productive capacity than could England. The major question from the British point of view in 1940 was how soon and how effectively could the United States push deliveries of aircraft and engines.

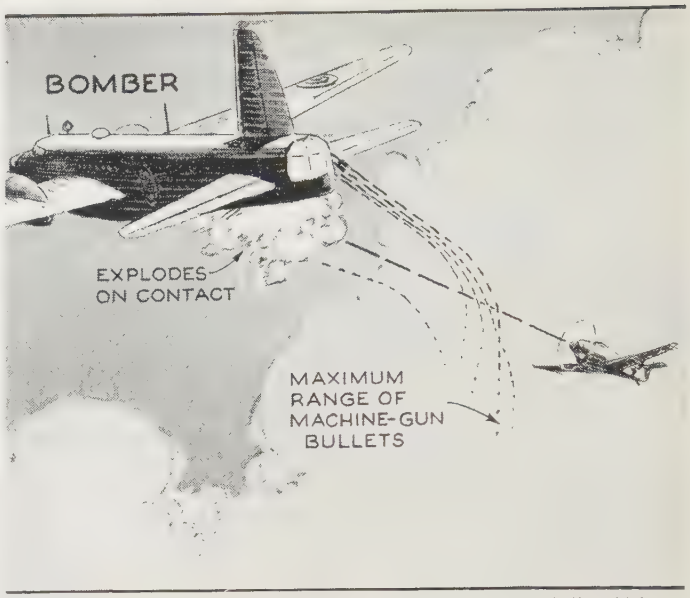
In the *Book of the Year, 1940* an attempt was made to score the air strength of the major powers on the basis of such fundamental elements as: aircraft on hand, capacity to produce, ability to train pilots and mechanics, and the general morale of the working population. At that time Germany was considered the yardstick against which the air power of other nations must be measured. It would be far more difficult (Jan. 1, 1941) to make a comparison in anything like the same form. For some of the reasons given above, many of the basic elements had been shifted tremendously, and for obvious military reasons it was impossible (Jan. 1, 1941) to get an accurate picture in detail.

There was little doubt, however, but that at year's end Germany still occupied a dominant position in the air. German squadrons raided British cities seemingly at will—witness the bombing of Coventry on Nov. 15, 1940, in the course of which some 500 aircraft were said to have been employed and well over 1,000,000 lb. of bombs dropped. A few weeks later, raids of the same order of magnitude wiped out large areas in the City of London and partially destroyed Bristol and several other seaport towns.

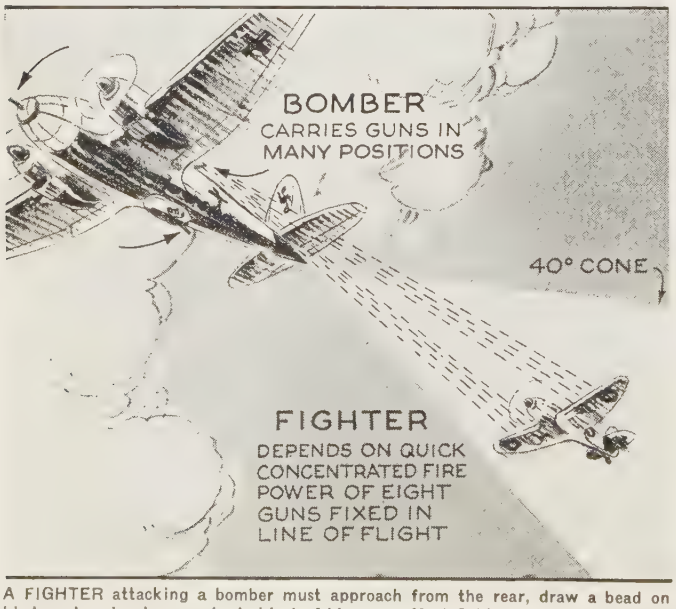
According to a Berlin report dated Jan. 2, 1941, over 2,000 bombing attacks were made on Great Britain by the German *luftwaffe* since Aug. 8, 1940. It is claimed that over 92,000,000 lb. of high explosive bombs and over 3,500,000 lb. of incendiaries were dropped on British soil during that period. British reports indicated that air-raid casualties for the last six months of 1940 came to about 50,000, of which some 19,500 people were killed. If both sets of figures are accurate, it cost Germany about one ton of bombs for each casualty inflicted, or about two and a half tons for every citizen killed. This is not, however, any true measure of the effectiveness of aerial bombardment under the Douhet theory. The cost to Great Britain in terms of property destroyed, production disrupted and life in general rendered extremely uncomfortable is beyond computation.

The British conducted retaliatory raids of some magnitude, but Germany claimed that it dropped 25 lb. of bombs on Great Britain for every pound the royal air force dropped on Germany.

That some such disparity existed is not impossible. Germany operated against key British cities at ranges of only 50-100 mi. from bases in France. One bomber might easily make two or three trips nightly against cities in the Midlands. The R.A.F., on the other hand, flew over the North sea and many miles over hostile territory before reaching most German objectives of importance. This not only increased the danger of detection and interception, but seriously reduced the bomb loads that might be carried. It is many times more difficult to deliver a ton of bombs in Berlin than in London. But the R.A.F. was making marked progress against tremendous odds. At the close of 1940, indications were that the British were beginning to reduce the 25-to-1 ratio considerably. Reports indicated that the R.A.F. inflicted damage at Bremen and Hamburg of something near the magnitude of the German raids against Coventry and Bristol. (*See* also Aviation, Civil; Chemical Warfare; European War; Lightning War; Munitions of War; Strategy of the European War; Tactics in the European War.) (S. P. J.)



SOME MODERN FIGHTERS are equipped with cannon, firing shells which explode on contact. Such planes can fire from outside the effective range of machine guns in the tail of the bomber



A FIGHTER attacking a bomber must approach from the rear, draw a bead on his target and unloose a single blast of his guns. Most fighters carry only enough ammunition for a half minute of continuous firing

Air Mail: *see* Post Office.

Airports and Flying Fields.

In the United States, a record-breaking expansion in all flying activities occurred as a result of the European war. Airline traffic expanded at an unprecedented rate and thousands of new pilots were being trained in 1940 under the programs of the army and navy and the civilian pilot training program of the Civil Aeronautics administration. In order to meet the demand created by this expansion for airports in addition to those required for national defence, congress in the fall of 1940 appropriated the sum of $40,000,000 to be expended for airport construction as a part of a well rounded long range program to meet the nation's airport needs, this construction to be accomplished under the supervision of the Civil Aeronautics administration. While most of the fields which were to be improved and developed under this program were to be used primarily for military aviation in national defence, they will, at some future date, be converted back to civil aviation and aviation as a whole will gain materially from this program.

Federal Airway System of the United States.—The expansion in all flying activities, coupled with the emergency expansion in 1940, emphasized the need for an expanded federal airway system providing adequately lighted airways fully equipped with radio communications and weather reporting facilities throughout the United States and its possessions. To meet these developments, the Civil Aeronautics authority during 1939 and 1940 conducted an expansion program on a scale larger than ever before. This program, which included both new construction and improvements to existing airways, added 3,432mi. of new airline highways

to the federal airway system. The Civil Aeronautics administration was engaged in 1940 on a new program which, adding another 2,500mi. of airways, will be marked by important expansions in Alaska, the United States islands in the Pacific and the Caribbean area. On July 1, 1940, there was completed a federal airway system embracing 28,745mi. of airways in full operation in the continental United States. Facilities installed on these airways comprised 2,205 beacons of various types, 296 lighted intermediate landing fields, 105 full power radio range and communication stations with broadcast facilities, 136 medium power range and communication stations, 33 low power radio range stations, 42 non-directional radio marker beacons and 45 ultra-high frequency markers, with the addition during 1940 of 3,410mi. of teletype circuits for weather reporting. These circuits, July 1, 1940, totalled 27,068 miles.

Air Navigation Facilities in the United States on Nov. 1, 1940
Source: *Civil Aeronautics Journal*

AIRPORTS	
Municipal airports*	687
Commercial airports**	493
Civil Aeronautics Authority intermediate fields†	282
Army aerodromes‡	68
Naval air stations¶	20
Marked auxiliary fields§	662
Private fields‖	125
Total	2,337
Airports and landing fields having any night lighting equipment:	
Municipal	301
Commercial	92
Intermediate	282
Army	37
Navy	13
Auxiliary	32
Private	9
Total	766
SEAPLANE BASES	
Army, Navy, Coast Guard	29
Other seaplane bases and anchorages	294
Total	323
Seaplane bases having any night lighting equipment:	
Navy and Coast Guard	5
Other bases and anchorages	9
Total	14
RADIO AIDS	
Ranges (2 in Hawaii; 4 in Alaska)	280
Range stations, simultaneous with voice (4 in Alaska)	182
Range stations, nonsimultaneous with voice	81
Range stations, no voice (2 in Hawaii)	17
Broadcast stations (7 in Alaska)	113
Broadcast stations, simultaneous (4 in Alaska)	108
Broadcast stations, nonsimultaneous (3 in Alaska)	5
Marker stations	42
Fan markers	103
Voice only (8 in Alaska)	14

*Municipally operated, servicing available. **Privately operated, servicing available. †Operated by C.A.A., no servicing available. ‡Army operated, open to service planes only. ¶Navy operated, open to service planes only. §Limited area, no servicing. ‖Privately operated, no servicing.

Washington National Airport.—Upon completion, in the early part of 1941, the Washington National airport may well serve as a model for all metropolitan terminals of air traffic. While not the largest in the world, its size is sufficient to provide with future developments for all foreseeable airline traffic. The safety and other aeronautical factors in its design are well in excess of the usual requirements. Runway lengths are: N. to S., 6,875ft.; N.W. to S.E., 5,300ft.; N.E. to S.W., 4,820ft.; and E. to W. 4,200ft.

The terminal building lies almost in the centre of the development and is connected by taxiways to the ends of each of the four runways. The building itself runs 540ft. along a curved line and is three stories high exclusive of the control tower from which every part of every runway is visible. The ground floor is almost exclusively working space; the main floor is devoted to the handling of passenger traffic and visitors; the upper floors are for airline and airport officials except for the dining room in the north wing and for the operation of airway and airport traffic control, radio communications and weather bureau. The main dining room extends 120ft. by 40ft. and its east wall is entirely of glass and faces a 20ft. dining terrace overlooking the flying field, the river and the city. The lessees of this space are expending some $300,000 in decoration and equipment. Parking space will be provided for about 5,000 cars ordinarily, with emergency space for about 3,000 more. There likewise will be bleachers or a grandstand along the edge of the flying field and 10ft. above it running north from the terminal building. These facilities were determined upon after careful studies of airports, both in the United States and in other countries. It was learned, for instance, that before the war which started in 1939 a large part of the patronage of the Dutch airlines was secured from among the sight-seers who came to Schipol airport at Amsterdam, and that the patronage of the restaurants and observation terraces on the mile-long roof of the hangars at Tempelhof in Berlin paid a large share of the cost of the airport.

With 144 scheduled landings and take-offs every 24 hours, Washington was in 1940 the third busiest airport in the United States. In addition, other airlines filed applications for service into Washington. Hence it is predicted that the new airport will be devoted mainly to airline service. The airport will cost in the neighbourhood of $12,500,000 when completed. (E. M. E.)

Air Races. In a year when events in the air struck a far more sinister note than in any previous year since 1918, the number of air race events were, by necessity or by governmental order, temporarily cancelled. Chief among these were the 1940 National Air races which, for 19 years, had been a world famous annual event. One explanation for this is the fact that aeroplane production was almost completely occupied in defence activities with few racing planes being made for private use.

However an annual event—the Bernarr Macfadden Trophy race—was won by H. C. Rankin of Wichita, Kan. He won the race at Miami, Fla., flying a new type Beechcraft twin-motored plane. The prize was $3,000. Rankin averaged 234·097 m.p.h. over the 1,080-mi. course from St. Louis, Mo. He made the nonstop flight in 4hr. 37min. 40sec.

Another air race of significance was the Firestone Trophy race, the feature event of 1940 for aerial flivvers. Jack Snodgrass captured this race, flying the 15-mi. course at an average speed of 105·255 m.p.h.

One event with international flavour was the Colonel Batista Cup race for aerobatics at Camp Columbia airfield. This was won by Capt. Alexander Papana.

Among the few air events for women fliers was the Culver Trophy races in California. This was won by Edna Kidd of New Orleans, who finished just in front of the famed Laura Ingalls of Burbank, Calif. (T. J. D.)

Air Raid Precautions: *see* ELECTRIC LIGHTING: *Lighting Applications;* LONDON.

A.L.A.: *see* AMERICAN LIBRARY ASSOCIATION.

Alabama, one of the "deep south" states of the United States, admitted to the union 1819; area, 52,250 sq.mi.; population (U.S. census, 1940) 2,832,961. Capital, Montgomery, 78,084. Cities with larger population are Birmingham, 267,583 and Mobile, 78,720. Of the state's population in 1940 855,941 were urban, or 30·2%. There were in 1930 1,700,775 whites; 944,834 Negroes; 2,630,370 native-born; 15,878 foreign-born.

History.—In the presidential election of 1940 the voting was as follows: Roosevelt (Dem.) 250,723; Willkie (Rep.) 42,184; Babson (Prohibitionist) 700; Browder (Communist) 509; Thomas (Socialist) 100. Chief officers of the state elected for service beginning Jan. 16, 1939 were: governor, Frank M. Dixon; lieutenant governor, A. A. Carmichael; state auditor, Howell Turner; secretary of state, John Brandon; state treasurer, C. E. McCall; attorney general, T. S. Lawson; superintendent of education, A. H. Collins; commissioner of agriculture and industries, J. H. Paterson.

Education.—A well defined system of elementary and high schools and colleges for both races is maintained. Elementary education is free between the ages of 6 and 21, and compul-

sory between the ages of 8 and 16. State appropriations in 1940 amounted to $14,770,041. Total revenues from all sources were approximately $28,280,000. Illiteracy among whites between 10 and 20 years is 1·9%, Negroes 2·6%. There are seven state-supported institutions of higher education for whites and three for Negroes. Several colleges are maintained by the Methodists, Baptists and Catholics.

Charities and Correction.—The state supports many philanthropic and penal institutions: institutions for the deaf and blind of both races; hospitals for the insane of both races; a school for feeble-minded children; training schools for wayward white boys and girls; and a reformatory school for Negro boys; a child welfare department; juvenile courts; a model state prison and a penitentiary system in which the state provides employment for its convicts.

Banking and Finance.—In 1940 there were 66 national banks with a capital stock surplus and undivided profits of $50,462,000, deposits of $233,731,000 and total assets of $268,659,000; 151 state banks with a capital stock surplus and undivided profits of $22,224,499, deposits of $96,320,940 and total assets of $111,-644,594. Revenue sources include a property tax, income tax, sales tax, privilege taxes and levies on gasoline, tobacco, beer and liquor. Receipts for the fiscal year ending Sept. 30, 1938, were $55,987,312; disbursements, $57,239,498; state debt, $68,-100,000.

Agriculture, Manufactures, Mineral Production.—Alabama ranked second among the cotton-planting states in 1860. Many crops are produced in large quantities, but cotton is still the most important one. The state had an estimated output of 790,000 bales in 1940, compared with an annual average for the ten years (1930–39) of 1,200,000 bales. In 1935 there were 273,455 farms covering 19,660,828 ac. with lands and buildings valued at $368,-219,654.

In 1929 there were 2,848 establishments hiring 132,200 workers and producing goods valued at $560,378,132. In 1940 there were about 1,800 establishments, but industrial pay rolls were much larger than in 1929; there were about 20,000 more employees and output in the major fields reached new high levels. A $15,-000,000 aluminium plant was established at Sheffield and a large shipbuilding plant at Mobile. A great expansion of the steel industry was under way. The two great basic industries are cotton textiles and iron and steel. Other important industries are lumber, blast-furnace products, cast-iron pipes and fittings, cotton-seed oil and meal, coke-oven products, cement and electric power. The manufacture of electricity is one of the state's most important industries. The capacity of the generating plants of the Alabama Power company is about 900,000 h.p. and the TVA plants in the state are capable of producing slightly more. There are about 6,000 mi. of rural electric lines. The mineral output of the state was valued at $53,518,993 in 1937 with coal and iron ore leading.

(A. B. Mo.)

Alaska. Alaska, in its greatest extent, is included between the meridians of 130° W. longitude and 173° E. longitude and between the parallels of 51° and 72° N. latitude. It is bounded on the north by the Arctic ocean; on the west by the Arctic ocean, Bering strait and Bering sea; on the south and southwest by the Gulf of Alaska and the Pacific ocean; and on the east by the Yukon territory and British Columbia. The eastern boundary, from the Arctic ocean to the neighbourhood of Mount St. Elias, is the 141st meridian; thence southeastward to Portland canal it is irregular and cannot be described in general terms, except that it runs approximately parallel to the irregular shore line and about 30mi. therefrom.

Alaska is in approximately the same latitude as the Scandinavian peninsula; Point Barrow, its northernmost point, is in about the same latitude as North cape; Dixon entrance, which marks its southern boundary, is nearly on the same parallel as Copenhagen; Juneau is in the latitude of Oslo and Leningrad; and Sitka is in the latitude of Edinburgh.

The longitude of the western terminal of the Aleutian islands is almost identical with that of the New Hebrides islands and is the same as that of New Zealand; and Cape Prince of Wales, the most westerly point of the mainland, is nearly as far west as the Samoan islands. Thus a person travelling from New York to Attu island, the westernmost of the Aleutian chain, on reaching San Francisco will have accomplished less than half the journey from east to west.

The area of Alaska is about 586,400 sq.mi., one-fifth that of the United States. In 1940 the population was 72,524. A map of Alaska superimposed on a map of the United States of the same scale, demonstrates that the distance from the easternmost to the westernmost point in Alaska is equal to the distance from the Atlantic to the Pacific in the latitude of Los Angeles, and that its northernmost and southernmost points are as far apart as the Mexican and the Canadian boundaries of the United States.

History.—The most important occurrences in Alaska during 1940 relate to the inclusion of Alaska in the system of national defence. Until 1940, the only military forces in the vast territory were two companies of infantry stationed at Chilkoot barracks, near Haines—a survival of the days when thousands of prospectors sought the Klondike gold-fields. The year 1940, however, marked the establishment of an air training base, Ladd field at Fairbanks; a great air base near Anchorage, Elmendorf field; navy air stations at Sitka, Kodiak and Dutch Harbor. Construction on all of these was in process at the close of 1940. Work, also, on additional fields for military, as well as commercial purposes, was begun at Annette island near Ketchikan, the southern port of entry to Alaska, and at Yakutat. Likewise, 1940 marked the first organization of the Alaska national guard, four companies of which were authorized in July, and formally inducted into service in September and October by Governor Gruening.

Another significant event was the linking of Alaska by regular commercial air service with the United States. In June, Pan American airways inaugurated a bi-weekly clipper service from Seattle to Ketchikan and Juneau, from which point scheduled air service to Fairbanks and Nome had already been established.

Industries.—Alaska's chief products are fish, metals and fur. In 1940, fish and fish products shipped from the territory were valued at $40,104,493. Of this amount $34,441,082 represents the value of canned salmon alone, which is the principal industry of the territory. The total value of mine products shipped to the United States in 1940 was $25,296,000, of which the gold shipments amounted to $23,279,000. Furs valued at $1,892,968, not including the fur seals, were shipped from Alaska during the calendar year 1939, a decrease of $44,402 from the previous year.

(E. Gru.)

Albania. A kingdom in the western part of the Balkan peninsula. Its area is 10,800 sq.mi., its population was estimated at a little more than 1,000,000. Formerly a part of the Ottoman empire, the mountainous land inhabited by semifeudal tribes, of which the majority are Mohammedans, with a large Christian minority, was constituted in 1913 as an independent country. On April 7, 1939, Italian forces suddenly invaded Albania, King Zog was forced to flee and the country received on June 4 a new constitution, according to which it became a nominally independent kingdom under the crown of Italy. King Victor Emmanuel III, emperor of Ethiopia, became king of Albania and the principles of fascist life and morale were introduced officially

as the foundation of Albanian civilization. The fears aroused in neighbouring Greece and Yugoslavia as the result of this occupation were eased by repeated official Italian assurances that there was no intention of attacking other Balkan nations.

The year 1940 in Albania was taken up with the construction of strategically important roads to the Greek and Yugoslav frontiers, with the fortification of the country and with the storing of large military supplies. In Aug. 1940, the fascist press in Albania and in Italy began a violent campaign against Greece, accusing the latter of oppressing the Albanian minority in the Greek Epirus and claiming the need to protect and liberate these Albanians. In pursuance of this policy, Italy on Oct. 28 suddenly presented an ultimatum to Greece and three hours later started to invade the country from Albania. Against all Italian expectations, the heroic Greek resistance forced the fascist armies not only to withdraw entirely from Greece, but the Greeks were even able to carry the war into Albania. At the end of November they occupied the most important fascist military bases there, Kortcha (Koritza) in the north, the third largest town in Albania, situated in a well cultivated and prosperous area and Argyrokastro in the south, the fifth largest town. From there the Greeks pressed forward toward the sea, conquered Porto Edda, named after Mussolini's oldest daughter and pushed toward the great port of Valona and toward Elbasan in the centre of the country. The British royal air force repeatedly bombarded Valona and the other large Albanian port, Durazzo. It was reported that many Albanians rose against Italian domination and supported the Greek advance. On Dec. 19, the Greek commander, General Alexander Papagos, issued a decree which restored the Albanian law, as existing before the Italian occupation of Albania, in all the territories of Albania occupied by the Greek army. Henceforth only Albanian law was to be applied in Albanian courts except in cases where it might obstruct the Greek forces of occupation. (*See* also EUROPEAN WAR; GREECE; ITALY.) (H. Ko.)

Alberta. The most westerly of the prairie provinces of Canada, Alberta was created a province by act of the dominion parliament, Sept. 1, 1905. The area of the province is 255,285 sq.mi.; the population by the census of 1936 was 772,782 (486,335 rural and 286,447 urban) and was estimated as 789,000 by the Dominion Bureau of Statistics in 1939.

History.—William Aberhart, the premier, was elected to office Sept. 3, 1935 as head of the Social Credit government. All attempts to put the Social Credit plan into operation since that time have failed, despite the efforts of the government to set up provincial banking systems and to have the dominion government underwrite the net public debt of approximately $128,000,000.

Alberta first defaulted on a bond issue in April 1937, and successive defaults of the next three years totalled approximately $14,000,000. A bond issue of $750,000 bearing 4½% interest matured April 15, 1940 but was retained in the sinking fund, where it had remained since its issue April 15, 1935. In November, the treasury announced it would pay holders of debentures which matured June 1, 1937 interest at the rate of 2¼% annually for six months ending Dec. 1, 1940.

Premier Aberhart, who had announced in 1939, that he would appeal to the electorate the following year, dissolved the legislature Feb. 16, 1940. At this time the Social Credit party held 47 of the 57 legislative seats. In the election of March 21, 35 Social Credit and 22 Independent members were returned—a net loss of 12 seats for Aberhart's party. Almost the sole issue of the campaign was the monetary policy of the government. The Independents had appealed to the electorate to disclaim the financial policies of Aberhart and restore the province's credit. Aberhart asked the voters for another term in office so that he might continue his efforts to establish Social Credit.

Much attention was devoted during 1940 to the Rowell-Sirois report which recommended centralizing the fiscal and social administrations of all provinces in Ottawa. Premier Aberhart was opposed to this plan (as were the premiers of British Columbia and Ontario) on the ground that it would represent excessive interference by the dominion government in provincial affairs. A conference of the provincial premiers with Prime Minister Mackenzie King at Ottawa in Jan. 1941 came to naught.

Agriculture.—Alberta's principal crop is wheat. Other important grain crops are oats, barley, rye and flax. Statistics of output were difficult to obtain in 1940 because of the war. The aggregate farm capital, including land, buildings, implements and livestock, was estimated in 1938 at $676,614,000. The production of wheat in 1939 was approximately 150,000,000 bu.; oats 82,000,000 bu.; barley 27,000,000 bu.; rye 2,400,000 bu.; flaxseed 340,000 bushels.

Minerals and Fishing.—Petroleum has become an important industry in Alberta, with approximately 100 producing wells in Turner valley. In 1938 a royal commission was established to investigate the whole industry and explore the advisability of governmental control of wholesale and retail distribution. The output in 1939 was curtailed by the Petroleum and Natural Gas Conservation board which established quotas for the various producers.

Fisheries accounted for an income of $492,943 in 1938.

Alcoholic Intoxication: *see* INTOXICATION, ALCOHOLIC.
Alcoholic Liquor: *see* BREWING AND BEER; LIQUORS, ALCOHOLIC; WINES.

Alfalfa. Production of alfalfa hay in the United States in 1940 was placed at 30,578,000 tons, Dec. 1 estimates by the department of agriculture. This is about 11% more than the 1939 crop of 26,888,000 tons and 22% above the ten-year (1929–38) average of 24,597,000 tons. Alfalfa seed production in 1940 was 1,453,000bu.; in 1939 it was 1,488,200. (*See* HAY.)

U.S. Production of Alfalfa by States, 1940 and 1939

	1940 tons	1939 tons		1940 tons	1939 tons
California	3,393,000	3,229,000	Texas	306,000	248,000
Wisconsin	2,928,000	1,972,000	New Mexico	245,000	218,000
Minnesota	2,410,000	2,424,000	South Dakota	244,000	229,000
Iowa	2,362,000	1,798,000	Arkansas	160,000	148,000
Michigan	2,002,000	1,650,000	North Dakota	153,000	119,000
Idaho	1,950,000	1,819,000	Mississippi	150,000	150,000
Colorado	1,256,000	1,186,000	Virginia	150,000	120,000
Montana	1,148,000	1,102,000	Tennessee	142,000	122,000
Illinois	1,111,000	1,042,000	New Jersey	119,000	96,000
Ohio	1,073,000	1,032,000	Maryland	70,000	65,000
Utah	989,000	894,000	West Virginia	64,000	58,000
Kansas	950,000	656,000	Connecticut	48,000	37,000
Nebraska	916,000	790,000	Louisiana	46,000	48,000
Indiana	805,000	828,000	Vermont	29,000	25,000
Washington	788,000	720,000	Massachusetts	18,000	17,000
Oregon	686,000	673,000	North Carolina	17,000	14,000
New York	655,000	453,000	Delaware	12,000	12,000
Wyoming	598,000	532,000	Georgia	11,000	9,000
Missouri	562,000	439,000	Maine	8,000	9,000
Oklahoma	561,000	436,000	New Hampshire	8,000	5,000
Pennsylvania	433,000	355,000	South Carolina	6,000	5,000
Arizona	364,000	405,000	Alabama	4,000	4,000
Nevada	320,000	286,000	Rhode Island	2,000	2,000
Kentucky	306,000	317,000	Florida	....	....

(S. O. R.)

Algeria: *see* FRENCH COLONIAL EMPIRE.
Aliens: *see* IMMIGRATION; LAW (CASE).

Alimentary System, Disorders of. **Disorders of the Oesophagus.**—On the basis of experiments on the cadaver with oesophageal varices, Juzbašić proposed a new method of intervention which

includes three main steps; namely, interruption of all venous afferent tracts traversing the small omentum, interruption of similar tracts from the region of the spleen and performance of a modification of the Talma operation to facilitate the discharge from the portal vein into the vena cava. The less formidable procedure of injecting a sclerosing solution into the veins was also recommended by Moersch.

The Stomach and Duodenum.—A profusion of investigations pertaining to all physiologic phases of the alimentary tract concerned the response of the digestive organs to various drugs, many of which are currently employed. Horstmann's observations on the comparative effect of insulin and histamine on gastric secretion are confirmative of observations made by others that histamine is not the ideal secretory stimulus and that it may be uncertain in its effects.

Bloomfield, Chen and French, in a study of basal gastric secretion, showed that basal acidity in cases of duodenal ulcer often exceeds the highest control levels, the measurement thereby having definite diagnostic value. This supports Hurst's conception of a hypersthenic gastric diathesis. Values for basal acidity in cases of gastric ulcer were found to be similar to the controls. This fact suggests that gastric ulcer and duodenal ulcer are fundamentally different disorders.

The majority of investigations confirm the injurious effect of tobacco on the stomach. Westphal and Weselmann determined the extent of nicotine injury on the gastric mucous membrane on the basis of gastric cell count, gastroscopy and roentgenoscopy in the human subject and substantiated their findings by animal experimentation. Persons with a labile vegetative nervous system should particularly be warned against the hazards of excessive smoking. These authors expressed the opinion that nicotine is a directly contributing aetiological factor in peptic ulcer.

Vitamin deficiency states and their effect on gastrointestinal form and function and the nutritional shortcomings of patients requiring operation are of increasing interest to the physician and surgeon alike. Weir, Butt and Snell called attention to vitamin K deficiency and hypoprothrombinaemia in conditions other than those due to hepatic disease or jaundiced states. These are gastrointestinal disorders, the general nature of which suggests that there is deficient absorption of vitamin K from the intestinal tract. They include sprue, regional ileitis, intestinal obstruction, gastrocolic fistula, pyloric obstruction and ulcerative colitis. Cheney reported the presence of such deficiency in a case of cholecystic disease without clinical jaundice or hepatitis.

The Biliary Tract and Pancreas.—Observations on the comparative value of roentgenography and duodenal drainage in the diagnosis of biliary calculus were made by Levyn and Meyers. In 45·5% of 33 cases of calculus, surgically verified, positive evidence was afforded by the roentgenologic examination, whereas duodenal drainage gave evidence of the presence of calculi in 85%. Duodenal drainage, however, erroneously indicated the presence of calculi six times in 21 cases in which calculi were not present, whereas the roentgenologic examination did not reveal shadows of calculi in a single instance.

Weyeneth and Wassmer expressed the opinion that acute pancreatic necrosis is a manifestation of autodigestion initiated by the activation of trypsin and manifested by necrosis and haemorrhage, while the lipase subsequently produces fat necrosis. The frequency of this pancreatic disorder in the presence of biliary lithiasis indicated the important role of bile in the development of pancreatitis. Treatment employed with success in five cases was as follows: strict abstinence from food and liquids, restriction of chlorides for 48 hours to diminish pancreatic oedema, daily phleboclysis of 1 to 2 litres of 10% solution of dextrose and from 15 to 30 units of insulin, large doses of atropine to diminish pancreatic secretion, enemas to relieve distention, application of an ice bag to the epigastrium and administration of morphine. After four to six days fruit juices and carbohydrates are permitted. Later the biliary tract is examined and in the presence of pathologic changes operation is feasible to prevent recurrences.

The Intestine.—Absorption of various materials from the small intestine in health and disease was in 1940 the subject of much research, the results having a practical bearing on various therapeutic problems. Metabolism and absorption of iron from the gastrointestinal tract were studied intensively by Moore and his collaborators. Serum iron has been demonstrated to be transport iron. When ingested iron reaches the stomach it is subjected to the influence of the prevailing acidity, the free gastric hydrochloric acid apparently having the twofold function of ionizing and dissolving iron not already present in solution or not in an ionized state and of delaying the formation of insoluble and disassociated compounds. Iron is absorbed from the intestinal tract largely, if not entirely, as ferrous iron. Arrowsmith and Minnich have found that iron absorption occurs largely in the duodenum and upper part of the jejunum. (*See* also VITAMINS.)

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All-American Canal: *see* AQUEDUCTS; IRRIGATION.

Allergy. During 1940 several measures which had been prematurely recommended for various allergic conditions, were proven ineffective. The value of histaminase for relief of various allergic symptoms was disproved by numerous workers (Miller and Piness, Laymon and Cumming and others). Potassium salts for hay fever and asthma were also found valueless (Rubin *et al.*, Spain *et al.*). The attempts at relief of hay fever by the oral administration of pollen were likewise found ineffective (Feinberg *et al.*). Previously accepted measures for the relief of intractable asthma were improved upon. Barach and Cromwell emphasized the importance of helium and oxygen inhalation with the simultaneous intravenous injection of concentrated glucose solution as well as of potassium iodide. For these difficult cases Richards and co-workers described additionally the value of continuous inhalation of epinephrin solution during the attack.

House dust, one of the most common causes of asthma still arouses interest of many workers. While Hampton and Stull proved in animal experiments that it contains a specific antigen differing from that found in common environmental substances (feathers, danders, etc.), the work of Coulson and Stevens indicated that house dust is probably composed of a mixture of many materials in varied proportions, including dried egg white. It may also contain a specific antigen in addition to these mixtures.

Respiratory allergy due to insect emanations is in some localities no longer a clinical oddity. Figley found the May fly is

a cause of symptoms in 7% of 1,284 seasonal hay fever cases in regions about inland bodies of water. Particles of the dried pellicle of the fly cause the symptoms. The importance of other common insects in allergy was further emphasized by Benson, who described severe symptoms following bee stings and mosquito bites and by Wittich who described asthma due to emanations from the Mexican bean weevil.

A possible explanation of the mechanism of sensitization was offered in the interesting observations of Lippard. Confirming the work of previous authors, he demonstrated that normal as well as allergic infants absorb undigested egg white from their highly permeable intestinal tract. The passage of such foreign protein into the blood stream results in the appearance of precipitins in the blood, a transitory phenomenon in both the normal and the allergic infant. The normal infant recovers with no evidence of symptoms. The child with an allergic predisposition (influence of heredity) fails to progress from sensitivity to immunity, and allergic symptoms develop. Similarly significant is the mode in which the skin becomes sensitive (eczema) as shown by the work of Landsteiner and Chase. They demonstrated in the guinea pig's skin that the spread of sensitivity is by way of the lymphatics. If a local skin area is sensitized with poison ivy after incising deeply enough around it to cut off all its lymphatics, the sensitivity remains localized to this skin area. If, however, the lymphatic circulation is not disturbed, such local sensitization becomes general. (*See* also DENTISTRY.)

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Alloys: *see* MAGNESIUM; METALLURGY; MOLYBDENUM; MONAZITE; NICKEL; TITANIUM; VANADIUM.

Almonds: *see* NUTS.

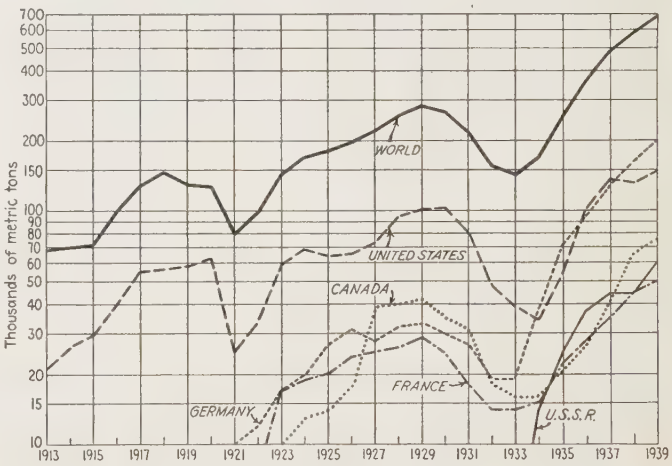
Alsberg, Carl Lucas (1877–1940), U.S. biochemist, was born in New York city, April 2. At the time of his death in Berkeley, Calif., Oct. 31, he was director of the Giannini Foundation of Agricultural Economics at the University of California. See *Encyclopædia Britannica.*

Alschuler, Alfred S. (1876–1940), U.S. architect, was born in Chicago, Nov. 2. He was educated at the Armour Institute of Technology and began to practise his profession in 1899. He designed many of the notable buildings in Chicago and was the first to use reinforced concrete construction in the city. He died in Chicago, Nov. 6.

"Altmark": *see* EUROPEAN WAR; GREAT BRITAIN; INTERNATIONAL LAW; NEUTRALITY.

Aluminium or Aluminum. World production of aluminium in 1939 was estimated at about 675,000 metric tons, distributed as follows: Germany, 200,000; United States, 148,400; Canada, 75,000; U.S.S.R., 60,000; France, 50,000; Norway, 31,000; Italy, 30,000; Switzerland, 28,000; Great Britain, 25,000; Japan, 23,000; and small amounts, 1,000–2,000 tons each, from Hungary, Spain, Sweden and Yugoslavia. No data whatever were available on production outside the United States in 1940, but it seems safe to assume that Germany remained well in the lead, in addition to which she also had in 1940 military control over the Norwegian output and probably had access to some Russian metal if it was required. The French output was outside the occupied area, but if the metal were needed in Germany pressure would doubtless be put on the Vichy government to secure it. Japan was making strenuous efforts to increase her output, which was only about 50% of consumption in 1939, although such data as were known by Jan. 1, 1941 on plant capacity would indicate that this was about 75% of consumption, with six reduction plants in operation; since 1939 six new reduction plants and five plants for the purification of bauxite were licensed, but nothing was known as to their capacity or progress on their construction.

No official report appeared on the aluminium output of the



ALUMINIUM PRODUCTION OF THE WORLD and the chief producing countries, as compiled by *The Mineral Industry*

United States in 1940, but bauxite production increased by 17% over 1939, to 438,000 long tons; imports of bauxite also increased by about 10%, but exports increased by almost the same tonnage, leaving net imports about 5% above the 433,000 long tons of 1939. Estimating on the basis of metal production from the available bauxite supply in past years, the 1940 output of aluminium might be expected to be of the order of 170,000 metric tons, an increase of 15% over 1939, but unofficial estimates for the year claim increases as high as 40%. Imports of crude and semi-finished metal during the first 11 months of 1940 were 14,872 metric tons, an increase of 28% over 1939, while exports dropped 9% to 27,724 tons. (*See* also CRYOLITE.) (G. A. Ro.)

Ambassadors and Envoys. The following is a list of ambassadors and envoys to and from the United States and to and from Great Britain Jan. 1, 1941.

To and From the United States

(*=ambassadors; unstarred, envoys.)

To the United States	*Country*	*From the United States*
*Espil, Felipe A.	Argentina	*Armour, Norman
Casey, Richard G.	Australia	Gauss, Clarence E.

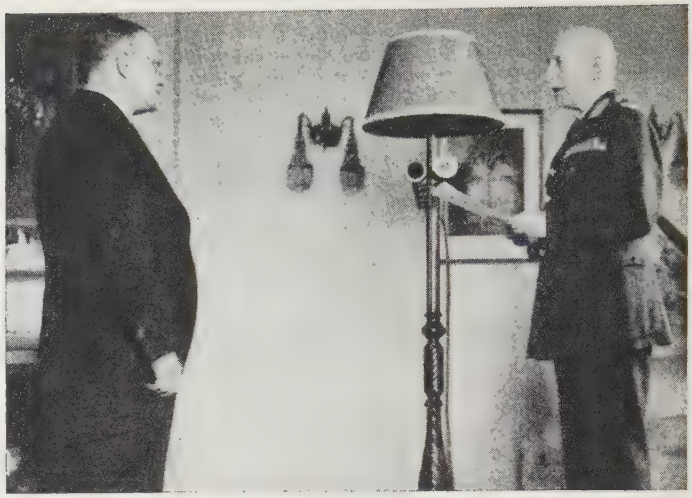
To the United States	*Country*	*From the United States*
*Straten-Ponthoz, Count Robert van der	Belgium	
Guachalla, Dr. Luis F.	Bolivia	Jenkins, Douglas
*Martins, Carlos	Brazil	*Caffery, Jefferson
Naoumoff, Dimitri	Bulgaria	Earle, George H., III
Christie, Loring C.	Canada	Moffat, Jay Pierrepont
*Cabero, Alberto	Chile	*Bowers, Claude G.
*Hu Shih, Dr.	China	*Johnson, Nelson T.
*Turbay, Dr. Gabriel	Colombia	*Braden, Spruille
Fernández, Luis	Costa Rica	Hornibrook, William H.
*Martínez Fraga, Dr. Pedro	Cuba	*Messersmith, George S.
Hurban, Vladimír	Czechoslovakia	
Kauffmann, Henrik de	Denmark	Atherton, Ray
Pastoriza, Andrés	Dominican Rep.	Scotten, Robert M.
*Alfaro, Capt. Colón E.[1]	Ecuador	Long, Boaz
Hassan Bey, Mahmoud	Egypt	Fish, Bert
Brennan, Robert	Eire (Ireland)	Gray, David
Castro, Dr. Hector D.	El Salvador	Frazer, Robert
Kaiv, Johannes[2]	Estonia	Wiley, John C.[4]
Procopé, Hjalmar J.	Finland	Schoenfeld, H. F. Arthur
*Henry-Haye, Gaston	France	*Leahy, William D.
*Dieckhoff, Hans H. (Absent)	Germany	
*Halifax, Viscount (appointed)	Great Britain	*Kennedy, Joseph P.
Diamantopoulos, Cimon P.	Greece	MacVeagh, Lincoln
Recinos, Dr. Adrian	Guatemala	Des Portes, Fay A.
Lescot, Elie	Haiti	Mayer, Ferdinand L.
Caceres, Dr. Julian R.	Honduras	Erwin, John D.
Rothkugel, Stephen de[3]	Hungary	Montgomery, John F.
Schayesteh, Mohammed	Iran	Dreyfus, L. G., Jr.
*Colonna, Ascanio d.p.	Italy	*Phillips, William
*Nomura, Kichisaburo (appointed)	Japan	*Grew, Joseph C.
Bilmanis, Dr. Alfred	Latvia	Wiley, John C.[4]
Zadeikis, Povilas	Lithuania	Norem, Owen J. C.[5]
*Castillo Nájera, Dr. Francisco	Mexico	*Daniels, Josephus
Loudon, Dr. A.	Netherlands	Gordon, George A.[6]
DeBayle, Dr. León	Nicaragua	Nicholson, Meredith
Munthe de Morgenstierne, Wilhelm	Norway	Harriman, Mrs. J. Borden[6]
Ehrman, J. H.[3]	Panama	*Dawson, William
Soler, Dr. Juan José	Paraguay	Howard, Findley B.
*Freyre y Santander, Manuel de	Peru	*Norweb, R. Henry
Kwapiszewski, Michal[3]	Poland	*Biddle, Anthony J. Drexel, Jr.[6]
Bianchi, João A. de	Portugal	Pell, Herbert C.
Coste, Brutus[3]	Rumania	Gunther, Franklin M.
*Cárdenas, Juan F. de	Spain	*Weddell, Alexander W.
Boström, W.	Sweden	Sterling, Frederick A.
Bruggmann, Charles	Switzerland	Harrison, Leland
Seni Pramoj, Rajawongse	Thailand	Grant, Hugh Gladney
*Ertegün, Mehmet M.	Turkey	*MacMurray, John Van A.
Close, Ralph W.	Union of South Africa	Keena, Leo J.
*Oumansky, Constantine A.	U.S.S.R.	*Steinhardt, Laurence A.
Richling, J.	Uruguay	Wilson, Edwin C.
*Escalante, Dr. Diógenes	Venezuela	*Corrigan, Frank P.
Fotitch, Constantin	Yugoslavia	Lane, Arthur B.

[1]Rank of ambassador for duration of boundary negotiations between Ecuador and Peru. [2]Acting consul general, in New York city. [3]Chargé d'affaires ad interim. [4]Accredited to both Estonia and Latvia; both ministries closed. [5]Ministry closed. [6]Government established in England.

To and From Great Britain

(*=Ambassador; unstarred=Envoy-Extraordinary; ‡=Minister Resident; §=Chargé d'Affaires.)

To Great Britain	*Country*	*From Great Britain*
Sardar Ahmed Ali Khan	Afghanistan	Fraser-Tytler, Lt.-Col. Sir W. K.
*Le Breton, Dr. Tomás A.	Argentina	*Ovey, Sir Esmond
*de Marchienne, Baron E. de C.	Belgian Govt.	*Oliphant, Sir Lancelot (interned by Germans)
Patiño, Antenor	Bolivia	Dodds, J. L.
*de Aragão, J. J. Moniz	Brazil	*Knox, Sir Geoffrey G.
Momtchiloff, Nicholas	Bulgaria	Rendel, G. W.
*Señoret, Octavio	Chile	*Orde, Sir Charles W.
*Quo Tai-chi	China	*Kerr, Sir Archibald Clark
Jaramillo Arango, Dr. Jaime	Colombia	Paske-Smith, M. B. T.
(*Vacant*)	Costa Rica	Dodd, C. E. S.
de Blanck, Guillermo	Cuba	Ogilvie-Forbes, Sir G.
§Lisický, Karel	Czechoslovak Provis. Govt. (in London)	[1]Bruce-Lockhart, R. H.
Reventlow, Count Eduard	Denmark	
Henriquez-Ureña, M.	Dominican Republic	‡Paterson, A. S.
§Puig-Arosemera, Alberto	Ecuador	‡Bullock, G. H.
*Hassan Nashat Pasha	Egypt	*Lampson, Sir Miles
Torma, August	Estonia	
Gripenberg, Georg A.	Finland	Vereker, G. G. M.
	France	
Simopoulos, Charalambos	Greece	Palairet, Sir Charles M.
§Figueroa, Dr. Francisco A.	Guatemala	Leche, J. H.[2]
‡Magloire, Clément	Haiti	‡Hillyer, R. A. N.
	Honduras	Kemball, G. C.
de Barcza, George	Hungary	O'Malley, O. St. C.
§Benediktsson, Pétur	Iceland	Smith, C. Howard
Mohammad Ali Moghaddam	Iran	Bullard, Sir R. W.



THE FIRST U.S. MINISTER to Australia, Clarence E. Gauss (left) presented his credentials to the governor-general, Lord Gowrie, on July 17, 1940, at the Admiralty House, Sydney

To Great Britain	*Country*	*From Great Britain*
§Sayid Ata Amin	Iraq	*Newton, Sir B. C.
*Mamoru Shigemitsu	Japan	*Craigie, Sir Robert L.
Zarine, Charles	Latvia	
‡de Lynden, Baron Robert Aernout	Liberia	§Ponsonby, A. G.
Balutis, Bronius	Lithuania	
	Mexico	
Gen. Shingha Shamsher Jung Bahadur Rana	Nepal	Betham, Lt. Col. G. L.
van Verduynen, Dr. Michiels	Netherlands	Bland, Sir N. (in London)
Herdocia, Dr. C.	Nicaragua	Leche, J. H.
Colban, E. A.	Norway	Dormer, Sir Cecil F. J. (in London)
§Sandoval, R. Rivera	Panama	Dodd, C. E. S.
(*Vacant*)	Paraguay	§Brickell, D. F. H.
Benavides, A.	Peru	Forbes, V. C. W.
*Raczyński, Count Edward	Poland	*Kennard, Sir H. W. (in London)
*Monteiro, Dr. Armindo Rodrigues de Sttau	Portugal	*Campbell, Sir R.
§Florescu, Radu	Rumania	Hoare, Sir Reginald
(*Vacant*)	Salvador	Leche, J. H.
Sheikh Hafiz Wahba	Saudi Arabia	Stonehewer-Bird, F.H.W.
*The Duke of Alba	Spain	*Hoare, Sir Samuel
Prytz, Björn Gustaf	Sweden	Mallet, V. A. L.
Thurnheer, Walther	Switzerland	Kelly, D. V.
Vimolnart, Phra Manuvedya	Thailand	Crosby, Sir J.
*Aras, Dr. Tewfik Rüstü	Turkey	*Knatchbull-Hugessen, Sir H. M.
Kennedy, Joseph P.	United States	Halifax, Viscount
Castellanos, Dr. Daniel	Uruguay	Millington-Drake, E.
Maisky, Jean	U.S.S.R.	Cripps, Sir Stafford
Godfrey, Mgr. W. (Apostolic Delegate)	Vatican	Osborne, F. D'A. G.
Carnevali, Dr. Atilano	Venezuela	Gainer, D. St. C.
Soubbotitch, Ivan	Yugoslavia	Campbell, R. I.

[1]British representative. [2]Minister and consul-general.

American Academy of Arts and Letters

was organized in 1904 by the National Institute of Arts and Letters, a body organized in 1898 by the American Social Science association. Beginning with Nov. 14, 1940 a joint exhibition of the works of Childe Hassam, a member of the academy who died in 1935, and of Edwin Austin Abbey, a member who died in 1911, was shown in the art gallery and will continue indefinitely. The Abbey paintings were lent by Yale university. This gallery and the permanent museum were open and free to the public from 10 A.M. to 5 P.M. weekdays and from 2 to 5 P.M. Sundays and holidays. There were four vacancies in the academy caused by the death of Edwin Markham, Robert Grant, Frederick J. E. Woodbridge and Frederick F. S. Converse. The directors elected in 1940 were: Nicholas Murray Butler, president; Wilbur L. Cross, chancellor and treasurer; William Lyon Phelps, secretary. The other six directors elected were Stephen Vincent Benét, Van Wyck Brooks, Walter Damrosch, William Adams Delano, Charles Dana Gibson and Archer Milton Huntington. (G. D. V.)

American Academy of Arts and Sciences.

The academy is limited to 800 fellows and 130 foreign honorary members, divided among four classes: mathematical and physical sciences, natural and physical sciences, the social arts, the humanities. The officers for the year 1940–41 are: president, Harlow Shapley; corresponding secretary, Abbott P. Usher; recording secretary, Hudson Hoagland; treasurer, Horace S. Ford. The following papers were presented at regular monthly meetings: George R. Harrison, "New Methods in Spectroscopy"; George H. Edgell, "Selected Masterpieces in the Museum of Fine Arts"; Reginald H. Daly, "New Light on the Earth's Interior"; Clarence H. Haring, "Liberty and Despotism in South America"; Jeremiah D. M. Ford, "Hispano-American Culture"; Gregory Pincus, "Artificial Parthenogenesis and Sexual Reproduction in Animals"; A. E. Staley, "World Economy in Transition"; Hu Shih, "Some Philosophical Rebels of Seventeenth Century China"; C. C. Little, "Cancer Research and the National Health Problem." Two afternoon symposia were held:

On Dec. 13, 1939, the general topic "The Structure of the Earth" was discussed by Lyman Spitzer, F. G. Watson, R. D. Evans, L. B. Slichter, P. W. Bridgman and Francis Birch. On March 13, 1940, "Current Economic Problems" were discussed by A. H. Hansen, H. B. Killough, J. D. Black and A. F. Lucas.

The following papers were read by title, and will appear presently in the *Proceedings:* "The Measurement of Hydrostatic Pressure to 30,000 kg./cm.," P. W. Bridgman; "Neurohumors as Chromatophore Activators," G. H. Parker; "A Revision of the Nearctic Hemerobiidae, Sisyridae, Berothidae, Polystoechotidae, and Dilaridae," F. M. Carpenter; "Fossil Parasitic Hymenoptera of the Family Scelioidae from Baltic Amber," C. T. Brues. Grants in aid of research were made from the Rumford fund, the C. M. Warren fund and from the Permanent Science fund; 35 awards amounting to $10,250. (A. P. U.)

American Academy of Political and Social Science

continued to expand its activities during the year 1940 along the same general lines that it has followed through its 50 years of life. It provided a public forum for the discussion of questions of national and world importance, utilizing both publications and meetings for the purpose. On April 12 and 13 there was held the Forty-fourth Annual meeting, with the general subject, "The United States and a Durable Peace," the proceedings being published later under the title, *When War Ends.*

On Oct. 5 a meeting was held on "America's Food and Europe's Need," addressed by Professor John G. Black of Harvard university, Sir Willmott Lewis, Washington correspondent of the *Times* (London), and Clarence E. Pickett, executive secretary of the American Friends Service committee.

Each issue of *The Annals,* the bi-monthly journal of the academy, is a symposium on some chosen subject, and the six regular issues were published during 1940 with titles as follows: *Intergovernmental Relations in the United States* (Jan.); *Mexico Today* (March); *Marketing in Our American Economy* (May); *When War Ends* (July); *Our Foreign Commerce in Peace and War* (Sept.); *Children in a Depression Decade* (Nov.). Also there were published two pamphlets, entitled respectively *European Plans for World Order* and *The Roots of Totalitarianism.*

The most important innovation in the activities of the academy during 1940 was the establishment of a student membership, which confers all the privileges of the regular membership but at a cost to students of only $3 per year instead of the usual $5. (E. M. P.)

American Association for the Advancement of Science.

The officers of the American Association for the Advancement of Science for 1940 were Albert Francis Blakeslee, director of the Carnegie Institution for Experimental Evolution, president; Forest Ray Moulton, permanent secretary; Otis W. Caldwell, general secretary; John L. Wirt, treasurer; and Sam Woodley, assistant secretary. The retiring president, Dr. Wesley C. Mitchell, delivered an address on "The Public Relations of Science."

In 1940 the membership of the association passed 21,000. Its affiliated and associated societies, 174 in number, had a combined membership, including duplications, of nearly 1,000,000. The association held two meetings in 1940, its annual meeting in Columbus, Ohio, which closed on Jan. 2, and a joint meeting with its Pacific division, June 17–22. The attendance at the annual meeting was about 6,000, including representatives from every one of the 48 states, three dependencies and ten foreign countries. At this meeting a total of 2,154 addresses and papers were delivered or read. The annual association $1,000 prize was awarded to Dr. I. I. Rabi for his investigations of radio frequency radiations of molecules and atoms. Ten grants in aid of research were given. One of the features of the meeting was a symposium on "Blood, Heart and Circulation," organized by the section on medical sciences and participated in by 39 specialists in the field. This symposium was published by the association, the 10th symposium published in three years. Other symposia published during 1940 were "The Genetics of Pathogenic Organisms" and "The Cell and Protoplasm." In October the first of the non-technical Association Science Series was published, a book on *Multiple Human Births* by Dr. H. H. Newman.

At the summer joint meeting with the Pacific division, held in Seattle, Wash., there was an attendance of about 1,100 different persons and there were 644 addresses and papers on the programs. At this meeting the president of the Pacific division, Dr. Lewis M. Terman, delivered his retiring address on "Psychological Approaches to the Biography of Genius." (F. R. Mo.)

American Association of University Professors: *see* ACADEMIC FREEDOM.

American Bankers Association.

Membership in the American Bankers association in 1939–40 under the administration of Robert M. Hanes, president of the Wachovia Bank and Trust company, Winston-Salem, N.C., reached the greatest percentage since the organization was founded, with approximately 83%, or 14,333 of the banks in the United States belonging.

The association's activities and services to its membership were expanded during the year with the creation of four new departments for research in the banking field. These new divisions consist of a consumer credit department, a department of research in real estate and mortgage loans, a department of customer relations, and a department of economics.

Officers elected at the annual convention of the association in Atlantic City, N.J., Sept. 22–26, 1940, for the ensuing year were: president, P. D. Houston, Nashville, Tenn.; first vice-president, Henry W. Koeneke, Ponca City, Okla.; second vice-president, W. Linn Hemingway, St. Louis, Mo.; treasurer, B. Murray Peyton, Duluth, Minn.; executive manager, Dr. Harold Stonier, New York, N.Y.; senior deputy manager, Frank W. Simmonds, New York, N.Y.; secretary, Richard W. Hill, New York, N.Y.; national bank division, president, Andrew Price, Seattle, Wash.; vice-president, C. W. Bowman, Montgomery, Ala.; trust division, president, Carl W. Fenninger, Philadelphia,

Pa.; vice-president, Richard G. Stockton, Winston-Salem, N.C.; state bank division, president, Harry A. Bryant, Parsons, Kan.; vice-president, A. L. M. Wiggins, Hartsville, S.C.; savings division, president, Roy R. Marquardt, Chicago, Ill.; vice-president, Stuart C. Frazier, Seattle, Wash.; state secretaries section, president, Armitt H. Coate, Moorestown, N.J.; first vice-president, William Duncan, Jr., Minneapolis, Minn.; second vice-president, Fred M. Bowman, Topeka, Kan. (L. Gn.)

American Bar Association.

A committee on national defence was set up in September with headquarters in Washington, D.C., to make the skill and resources of the legal profession fully effective for national defence.

Under the chairmanship of Edmund Ruffin Beckwith of New York city, this committee helped organize the bar to co-operate in the administration of the Selective Service act by serving on advisory boards, boards of appeal and as appeal agents, and by giving legal aid to men called into service and their families. The committee prepared and distributed a manual for the use of advisory boards. Various committees recommended technical improvements in substantive and procedural law. Awards: annual medal of the association to Roscoe Pound, former dean of Harvard law school, for conspicuous service in the cause of American jurisprudence; Ross prize of $3,000 to Professor Thomas Fitzgerald Green of the University of Georgia law school for an essay on the subject "To What Extent May Courts Under Rule-Making Power Prescribe Rules of Evidence"; awards of merit to State bar of Texas and Cleveland Bar association.

Elected at the 1940 meeting were: Jacob M. Lashly, president; Thomas B. Gay, chairman of the house of delegates; Harry S. Knight, secretary; John H. Voorhees, treasurer; Joseph D. Stecher, assistant secretary. (M. Dn.)

American Bible Society.

The 124th annual meeting of the American Bible society was held in May 1940. John T. Manson is president. Gilbert Darlington is treasurer. General secretaries are Rev. Dr. Eric M. North, in charge of translation and foreign activities, and Rev. Dr. Frederick W. Cropp, in charge of activities in the United States. Rev. Dr. Francis C. Stifler is editorial and recording secretary.

The society distributes about 3,700,000 volumes of Scripture annually in the United States. In co-operation with the British and Foreign Bible society, the Scottish Bible society and other missionary organizations, the Scriptures were translated into 1,039 languages up to the end of 1939, and about 26,000,000 volumes of Scripture were distributed in 1939 throughout the world. The society's principal office is at Park avenue and 57th street, New York city, with branch offices in 11 cities in the United States and agencies, depositories and publishing offices in many other countries, in co-operation with the British and the Scottish Bible societies. The American Bible society elects a vice-president from each of the 48 states and among those so chosen have been Chief Justice Hughes, John R. Mott, William Lyon Phelps, J. L. Kraft and General Evangeline Booth. (F. C. St.)

American Chemical Society.

The society operates under a national charter from the 75th congress. In 1940, the presidency passed from Dr. C. A. Kraus of Brown university to Dr. S. C. Lind of the University of Minnesota, with Dr. William Lloyd Evans of Ohio State university as president-elect. He became president Jan. 1, 1941. National meetings in Cincinnati and Detroit showed attendances of 3,514 and 4,206 with 433 and 496 scientific papers, respectively. The 92 local sections were more active than ever. The awards of the society: to Eric G. Ball, the Eli Lilly and company award in biological chemistry; to Edward R. Weidlein, the Pittsburgh award; to R. E. Gibson, the Hillebrand award; to J. M. Nelson, the Nichols medal; to William Henry Bradshaw, the Schoellkopf medal; to Vladimir N. Ipatieff, the Willard Gibbs medal. Membership passed 25,000. (C. L. Ps.)

American Citizens Abroad.

The following is an estimate of the number of American citizens living abroad, as of Jan. 1, 1940, compiled from reports received from U.S. consulates in all parts of the world. This estimate includes only those whose residence abroad has a permanent or semipermanent character and therefore excludes tourists and all others whose sojourn abroad was considered to be only transitory. Attention is called to the fact that in spite of the care exercised by consuls in preparing their reports, it was impossible in many cases for them to obtain exact figures as to the number of Americans residing in their respective districts. Nevertheless, this estimate, based on all available sources of information, may be regarded as a fairly accurate world census of Americans living abroad.

SOUTH AMERICA		
Argentina	2,897	
Bolivia	475	
Brazil	4,086	
Chile	1,215	
Colombia	2,191	
Ecuador	504	
Paraguay	78	
Peru	1,489	
Uruguay	210	
Venezuela	3,357	
Total		16,502

MEXICO AND CENTRAL AMERICA		
British Honduras	175	
Costa Rica	987	
El Salvador	309	
Guatemala	1,142	
Honduras	1,074	
Mexico	13,262	
Nicaragua	576	
Panama	6,356	
Total		23,881

WEST INDIES AND BERMUDA		
Bahamas	200	
Barbados	347	
Bermuda	560	
Cuba	5,121	
Curacao	1,958	
Dominican Republic	2,550*	
Haiti	467	

WEST INDIES—Cont.		
Jamaica	718	
Trinidad	684	
Total		12,605

CANADA AND NEWFOUNDLAND		
CANADA		181,172
Alberta	27,220	
British Columbia	12,302	
Manitoba	29,080	
New Brunswick	2,343	
Nova Scotia	3,719	
Ontario	46,440	
Quebec	41,604	
Saskatchewan	18,464	
NEWFOUNDLAND		593
ST. PIERRE ET MIQUELON		8
Total		181,773

EUROPE		
Albania	233*	
Belgium	747	
Great Britain and Northern Ireland	7,514	
Bulgaria	93	
Czechoslovakia	485	
Danzig, Free City of	15	
Denmark	552	
Estonia	44	
Finland	278	
France	5,927	
Germany	5,274	

THE IMMEDIATE REACTION of the United States to signature of the Rome-Berlin-Tokyo pact Sept. 27, 1940, was to advise American citizens to leave the orient forthwith. The picture shows the S.S. "Monterey" leaving San Francisco to evacuate Americans from Asia

EUROPE—Cont.

Gibraltar		17
Greece		2,476
Hungary		800*
Ireland		1,960
Italy		19,561
Latvia		80
Lithuania		161
Luxembourg		65
Malta		98
Netherlands		892
Norway		1,067
Poland		532
Portugal		5,891
Lisbon	565	
Oporto	536	
Madeira	290	
Azores	4,500	
Rumania		595
Spain and Canary islands		2,218
Sweden		1,752
Switzerland		1,415
Union of Soviet Socialist Republics		400*
Yugoslavia		2,093*
Total		63,235

AFRICA

Algeria		61
Belgian Congo		800
Egypt		874
Kenya		446
Liberia		289
Morocco		189
Nigeria		408
Union of South Africa		1,891

*1939 estimate.

AFRICA—Cont.

Cape Province	434	
Natal	246	
Orange Free State and Transvaal	1,211	
Tunisia		98
Total		5,056

ASIA

Arabia		37
Ceylon		75
China		7,063
French Indo-China		128
Hongkong		1,547
India		3,896
Iran		155
Iraq		582
Japan		8,145
Netherlands East Indies		626
Palestine		8,500
Straits Settlements		526
Syria		1,380
Thailand		163
Turkey (including Turkey in Europe)		295
Total		33,118

FIJI ISLANDS	21
SOCIETY ISLANDS	178

AUSTRALIA AND NEW ZEALAND

Australia	1,882	
New Zealand	358	
Total		2,240
GRAND TOTAL		338,609

AMERICAN AND BRITISH women and children hastily evacuated Hongkong as Japanese threats to the colony multiplied in 1940

The following summary report covering persons procuring passports and renewals during the calendar year which ended Dec. 31, 1939, is based upon actual count compiled from individual passport and renewal applications filed during that year and not computed as heretofore from a cross-sectional study. This 1939 summary report is therefore not comparable with reports for years previous to 1938.

OCCUPATION

Accountant	625
Actor	365
Architect	157
Artist	643
Banker, broker	982
Buyer, exporter, importer	759
Clerk, secretary	5,252
Contractor	321
Doctor	1,281
Draftsman	284
Druggist	83
Engineer	2,625
Executive	3,313
Farmer-rancher	1,014
Florist	329
Housewife	13,274
Interior decorator	140
Labourer (common)	1,622
Labourer (skilled)	11,523
Lawyer	1,099
Librarian	320
Manufacturer	963
Merchant	1,686
Miscellaneous	2,873
Missionary	1,139
Musician	586
None	7,600
Nurse	1,276
Religious	1,824
Restaurateur	571
Retired	2,104
Salesman	1,834
Scientific	777
Servant	1,805
Student	8,780
Teacher	7,705
Technician	433
Tradesman	850
Writer	1,033
Total	89,850

DESTINATION

Africa	1,074
*All countries	460
Australia & New Zealand	1,207
Eastern Europe	4,018
Far east	5,409
Latin America	13,951
Near east	4,997
Western Europe	65,163
Canada and Newfoundland	44

OBJECT OF TRAVEL

Commercial	5,265
Education	3,689
Employment	5,399
Family affairs	3,597
Health	869
Personal business	23,790
Professional	2,479
Religious	1,861
Scientific	360
Travel	42,541

APPLICANT

Native	57,896
Naturalized	31,954
Male	48,820
Female	41,030

ADDITIONAL PERSONS INCLUDED IN PASSPORTS

Adults	13,200
Minors	10,431

PREVIOUS PASSPORTS

Number having been previously issued American passports	31,048

*While a great many applicants inserted "All countries" in the space provided in applications for destination, it is the opinion of the department of state that practically all who gave "All countries" as their destination contemplated visiting western Europe.

PERMANENT RESIDENCE 1939

	Number Receiving Passports or Renewals	Percent of Total
Alabama	300	0.34
Alaska	28	0.03
Arizona	263	0.29
Arkansas	176	0.20
California	10,525	11.71
Colorado	570	0.63
Connecticut	2,356	2.62
Delaware	224	0.25
Dist. of Columbia	1,085	1.20
Florida	879	0.98
Georgia	394	0.44
Idaho	147	0.16
Illinois	6,300	7.01
Indiana	961	1.07
Iowa	587	0.65
Kansas	430	0.48
Kentucky	340	0.38
Louisiana	769	0.86
Maine	325	0.36
Maryland	1,114	1.24
Massachusetts	5,415	6.03
Michigan	2,921	3.25
Minnesota	1,236	1.38
Mississippi	181	0.20
Missouri	1,393	1.55
Montana	218	0.24
Nebraska	364	0.41

*Exclusive of New York city.

PERMANENT RESIDENCE 1939

	Number Receiving Passports or Renewals	Percent of Total
Nevada	109	0.12
New Hampshire	252	0.28
New Jersey	5,855	6.51
New Mexico	158	0.18
New York city	18,424	20.51
*New York State	6,080	6.77
North Carolina	448	0.50
North Dakota	124	0.14
Ohio	3,824	4.26
Oklahoma	678	0.75
Oregon	585	0.65
Pennsylvania	5,895	6.56
Rhode Island	652	0.72
South Carolina	198	0.22
South Dakota	147	0.16
Tennessee	369	0.41
Texas	2,180	2.43
Utah	419	0.47
Vermont	164	0.18
Virginia	743	0.83
Washington	1,098	1.22
West Virginia	297	0.33
Wisconsin	1,518	1.69
Wyoming	132	0.15
	89,850	100.00

The United States maintains the following diplomatic and consular offices abroad: 20 embassies (10 perform diplomatic as well as consular duties); 33 legations (20 perform diplomatic as well as consular duties); 50 consulates general; 177 consulates; 3 vice-consulates. (R. B. S.)

American College of Surgeons. The college was founded in 1913 by 500 surgeons of the United States and Canada, under the leadership of the late Dr. Franklin H. Martin, to ensure a standard of professional, ethical and moral requirements for every graduate in medicine who practises general surgery or any of its specialties. Fellowship, 1941: 13,111. Chairman, board of regents, Dr. Irvin Abell, Louisville, Ky.; president, 1940–41, Dr. Evarts A. Graham, St. Louis, Mo.; president-elect, Dr. W. Edward Gallie, Toronto; treasurer, Dr. Dallas B. Phemister, Chicago, Ill.; secretary, Dr. Frederic A. Besley, Waukegan, Ill.; associate director and chairman, administrative board, Dr. Malcolm T. MacEachern, Chicago,

Ill.; associate director, Dr. Bowman C. Crowell, Chicago, Ill.; assistant directors, Dr. E. W. Williamson and Dr. Harold Earnheart, Chicago, Ill. The organization originated the hospital standardization movement, 1918, formulating minimum standards for approval and starting periodic surveys; 2,806 hospitals in United States, Canada and other countries were on the 1940 approved list; 345 cancer clinics in hospitals were approved in 1940 and 937 medical services in industry were approved in 1940. An approved list of medical motion picture films is also issued yearly. The college maintains a medical library and literary research department. The committee on graduate training for surgery (general surgery and the surgical specialties) was organized in 1937. Committees on cancer, archives of cancer, bone sarcoma, fractures and other traumas, and the Hall of the Art and Science of Surgery, function through a department of clinical research. Sectional meetings were held in 1940 in Los Angeles, Calif.; New Orleans, La.; and Detroit and Ann Arbor, Mich. The 30th Annual Clinical congress and the 23rd Annual Hospital Standardization conference, attended by 3,000 surgeons and 1,500 hospital executives, were conducted by the college in Oct. 1940, in Chicago. (M. T. M.)

American Council on Education: *see* EDUCATION; UNIVERSITIES AND COLLEGES.

American Economic Association.

The purpose of the American Economic association (founded in 1885) is to encourage economic research, issue publications on economic subjects, and stimulate thought and discussion of current problems from an economic point of view. The publications of the association consist of a quarterly, the *American Economic Review,* the proceedings of the annual meetings, occasional monographs on special topics and a biennial handbook or directory of its membership. The program of the 53rd annual meeting of the association, held in New Orleans, La., in Dec. 1940, was devoted to the treatment of current, vital economic problems in retrospect and prospect, economic regionalism and economic research.

Officers for the year 1941 are: president, Sumner H. Slichter, Harvard university; vice-presidents, James C. Bonbright, Columbia university; Walton H. Hamilton, Yale university; secretary-treasurer, James Washington Bell, Northwestern university; elected members of the executive committee, Stacy May, Rockefeller foundation; Edwin E. Witte, University of Wisconsin; N. S. B. Gras, Harvard university; Ray B. Westerfield, Yale university; J. Douglas Brown, Princeton university; George W. Stocking, University of Texas. Membership, as listed in the handbook of the association, numbering approximately 3,000 (an additional 1,300 libraries and other subscribers are not included), constitutes a veritable "who's who" of American economists.

American Ethnology, Bureau of: *see* SMITHSONIAN INSTITUTION.

American Federation of Labor.

Founded 60 years ago by the late Samuel Gompers and his associates, the American Federation of Labor has had many vicissitudes. During depression periods there have been some who despaired of further progress by the organization, but somehow the federation always managed to weather these depressions. The years 1930 to 1933 found the A.F. of L. ill-equipped to meet the impact of such an unprecedented depression. Funds ran low, unemployment took toll of membership, and leaders were discouraged. However, the enactment by congress of the National Industrial Recovery act stimulated workers to join unions because a provision of that law guaranteed the right of collective bargaining. A wave of unionization followed and many who had never joined labour organizations did so in the brief period that remained to the act before the supreme court invalidated it.

A slump followed this court action, but a wave of unionization again developed in 1935 after the National Labor Relations act was passed by congress.

Hardly had the new collective bargaining law become operative, however, when the Committee for Industrial Organization was formed. This committee stressed the idea of forming unions on an industry-wide pattern, with all workers in a plant members of one local union. The A.F. of L. had emphasized the separation of unions into skilled craft groups, although it also included in its affiliates industrial and semi-industrial unions.

The split between the A.F. of L. and the C.I.O. resulted in a defection of approximately 1,000,000 members. This seemed a disaster at the time, but in its 1940 report at the New Orleans convention the federation announced that it had more than made up its loss and had reached a record membership of approximately 5,000,000. Two significant things occurred in 1940 to affect the A.F. of L. The International Brotherhood of Teamsters became the first in membership of all A.F. of L. unions and the International Ladies' Garment Workers which had been affiliated with the C.I.O. returned to the federation.

William Green of Ohio, president since 1924 (successor to Mr. Gompers), was re-elected. For the second time George Meany of New York was elected secretary-treasurer. (*See* also CONGRESS OF INDUSTRIAL ORGANIZATIONS; LABOUR UNIONS; STRIKES AND LOCK-OUTS; UNITED STATES: *History.*) (L. STA.)

American Federation of Teachers: *see* EDUCATION: *Education and National Defence.*

American Geographical Society.

In addition to its regular quarterly periodical, the *Geographical Review,* and *Current Geographical Publications,* a classified list, published monthly, of accessions to its research catalogue, the American Geographical society issued the following publications: a monograph, "Inner Asian Frontiers of China," by Owen Lattimore; a monograph in mimeographed form, "A Series of Population Maps of the Colonies and the United States, 1625–1790," by H. R. Friis; and 13 sheets of the map of Hispanic America on the scale of 1:1,000,000, bringing the total number of published sheets of this 107-sheet map, on which the society has been engaged for the past 20 years, to 101. A revised edition of "Environment and Conflict in Europe: Eighteen Basic Maps," first issued in 1939, was also published and editorial work was completed on two books to be published early in 1941: *Focus on Africa,* a volume of aerial photographs and descriptive text, by Dr. Richard U. Light, and *The European Possessions in the Caribbean Area,* by a number of authors, mostly members of the society's staff.

The work of the department of mathematical geography was devoted chiefly to development of a stereoscopic map-plotting machine on which this department had been engaged for a number of years, and that of the department of exploration and field research, to the plotting of topographical maps from aerial photographs taken on expeditions sponsored by the society in the Yukon and in the Sierra Nevada de Santa Marta in Colombia, South America. In connection with the commemoration of the 500th anniversary of the invention of printing from movable type, a special exhibit was set up in the society's building of books and maps illustrating critical steps in the development of geography in the United States, and a descriptive catalogue of the exhibit, entitled *Milestones in American Geography,* was issued. The Cullum Geographi-

cal medal was awarded to Robert Cushman Murphy, curator of oceanic birds at the American Museum of Natural History, and the Charles P. Daly medal to Carl O. Sauer, professor of geography at the University of California. (R. R. P.)

American Historical Association was incorporated by act of congress in 1889 "for the promotion of historical studies . . . and for kindred purposes in the interests of American history and of history in America." It had (Jan. 1, 1941) a membership of about 3,573, chiefly recruited from the teachers and writers of history in U.S. and Canadian schools and colleges. Its national headquarters were in 1940 at Study Room 274, Library of Congress annex, Washington, D.C., but its chief administrative officer, the executive secretary, had offices at 226 South 16th street, Philadelphia, Pa. It was governed by a council elected at the annual meeting and supported by annual dues ($5) and by the income of an endowment fund of about $250,000. Its officers for the year 1941 were: president, James Westfall Thompson, professor emeritus of the University of California; first vice-president, Arthur M. Schlesinger, Harvard university; second vice-president, Nellie Neilson, Mt. Holyoke college; treasurer, Solon J. Buck, the National Archives; executive secretary, Conyers Read, University of Pennsylvania.

During the year 1940 it continued the publication of *The American Historical Review,* the leading historical journal in the U.S., and participated in the publication of *Social Education,* devoted to the problem of teaching the social studies in the school. It also published in 1940 *James VI of Scotland and the Throne of England,* by Helen G. Stafford; and *Proceedings* for 1938, printed by the United States government. (C. Rd.)

American Indians: *see* Indians, American.

American Institute of Architects. Founded in 1857, the American Institute of Architects is the national organization of the architectural profession in the United States. It is composed of upwards of 3,000 individual members, each of whom is a qualified architect. The members are grouped in 71 local chapters and 16 state associations. Through these organizations more than 8,000 architects of the United States are under its aegis. The objects of the organization are: To organize and unite in fellowship the architects of the United States; to combine their efforts so as to promote the aesthetic, scientific and practical efficiency of the profession; to advance education in architecture and in the arts and sciences allied therewith, and to make the profession of ever-increasing service to society.

The officers of the institute for 1940 were: president, Edwin Bergstrom, Los Angeles; vice-president, Walter R. MacCornack, Boston; secretary, Charles T. Ingham, Pittsburgh; treasurer, John R. Fugard, Chicago. Its headquarters are at 1741 New York avenue, N.W., Washington, D.C., operated jointly with "The Octagon," a colonial building of 1800, the latter as an historic monument.

American Iron and Steel Institute. The publication and distribution of books and pamphlets continued to be prominent among the activities undertaken in 1940 by the American Iron and Steel institute in promoting the interests of members of the iron and steel industry in the United States. Certain publications, such as the statistics of iron and steel production, the account of the general meeting of the institute and the periodical, *Steel Facts,* represented continuations of series. New publications included several sections of a manual covering definitions and descriptions of iron and steel products and booklets relative to the uses of steel in agriculture, and to the financial investment in, and earnings of, the steel industry. The institute likewise continued during 1940 its work of compiling and publishing a series of freight tariffs showing freight rates on iron and steel products from important origin points to principal destinations. Another important activity was the providing of accurate information relative to the industry. Thousands of inquiries from editors, writers, students and the public generally were answered by members of the institute staff during 1940. In connection with the national defence program, the institute was co-operating closely with the national defence advisory commission, with the war and navy departments and other government bodies. (W. S. To.)

American Judicature Society. The American Judicature society was founded in 1913 to promote the efficient administration of justice. Its first work was publication of a series of bulletins surveying the fundamental operations of judicial administration. The bi-monthly *Journal* has been published since 1917, and is sent free to all who wish to receive it. The society takes the entire range of judicial administration, civil and criminal, state and federal, as its field, and endeavours to present information concerning means for improvement of court and bar organization, judicial selection and tenure, civil and criminal procedure, and legal education and admission to the bar. Its publications have formed the foundation for virtually every reform accomplished and now under way in its field. During its first 12 years it was supported entirely by Charles F. Ruggles, a layman. In 1940 it had about 2,000 members, nearly all lawyers and judges. Membership is open to all, with dues at $5 a year. The society works in close conjunction with the American Bar association and with state and local bar organizations, all of which its *Journal* serves in the field of judicial administration. President of the society in 1940 was David A. Simmons, Houston, Tex., who was preceded in office by Arthur T. Vanderbilt, Frank E. Atwood, Newton D. Baker and Charles Evans Hughes. Herbert Harley has been secretary since it was founded. Its office is in Hutchins hall, University of Michigan, Ann Arbor, Mich. (H. Har.)

American Law Institute. Since its organization, the chief work of the American Law institute has been a *Restatement of the Law,* best described as an orderly statement of the present common law. While the sections into which the restatement is divided are written in statutory form, they are not presented to legislatures for adoption. The object of the restatement is to clarify and simplify the common law, but not to prevent its continued development by judicial decision. Prior to 1940, 14 volumes of the restatement were published, including the law of contracts, conflict of laws, agency, trusts, and restitution, besides large portions of the law of property and torts. During 1940 work on the restatement of the subjects, judgments, security and the fourth volume of the restatement of the law of property went forward. The institute was also engaged on two other projects of importance—the drafting of a model code of evidence and statutes dealing with the administration of the criminal law in so far as it affects youths between 16 and 21 convicted of crime. A model statute creating a treatment board to which such convicted youths will be sentenced was adopted at the annual meeting in May and steps have been taken to secure its consideration by state legislatures.

The American Law institute was organized in Feb. 1923. Its object is to carry on constructive scientific work for the improvement of the law. Aside from the official members, who are those

holding the leading judicial, bar, and law school faculty positions, there are 725 life members; membership being a distinct professional honour. The governing body is a council of 33. The members meet each year in Washington, D.C. All legal and other official publications of the institute must be first approved by the council and by a meeting of members. The president is George Wharton Pepper; William Draper Lewis is director and chief of the editorial staff. The executive office is at 3400 Chestnut street, Philadelphia, Pennsylvania. (W. D. L.)

American Legion. In 1940 when congress authorized the expenditure of $17,000,000,000 for military and naval uses, the American Legion's 21-year-old objectives for an adequate national defence were acknowledged as having been sound. The Legion achieved some of its aims for the internal defence through enactment of legislation requiring registration of all aliens, and through the continuation for the third year of the Dies Congressional committee for the investigation of subversive activities.

There was further expansion of the Legion's youth-training activities, with 62,000 pupils in 40 states participating in a nationwide high school oratorical contest; 15,000 selected boys enrolled in 34 boys' schools in which they were taught the mechanics of American self-government; and with 400,000 boys under 17 years of age playing in the nationwide junior baseball program. Child welfare, with the long-range program, continued seeking liberalized benefits for needy children in the state social security program, while the immediate program again was devoted to extending financial aid from Legion and other sources, amounting to $4,647,682.87 for 454,495 needy children; a rehabilitation program recovered grants totalling $3,255,498.96 in contested benefits for disabled veterans and their dependents. Membership was the highest in the history of the American Legion and its four affiliated organizations. The number of posts reached a new high.

The 22nd annual national convention was attended by 300,000 members and their families in Boston, Mass., Sept. 23 to 26, 1940. The convention went on record for all practicable aid to Great Britain and those aligned with her in their fight for freedom.

From resolutions adopted by the Boston convention, the national executive committee, at Indianapolis, Nov. 21 and 22, selected the following major national legislative program for 1941: (1) National defence, (2) government protection for World War widows and orphans, (3) civil service, veterans' preference and employment, (4) Americanism, including further restriction of immigration, continuation of the Dies committee and increasing of the personnel of the FBI.

The 1,451 official delegates, representing 58 continental and outlying departments, and four posts not attached to any department, named Milo J. Warner, Toledo, Ohio, attorney, to succeed Raymond J. Kelly, Detroit, Mich., as national commander, and chose Milwaukee, Wis., as the 1941 convention city.

Membership, American Legion and Affiliated Organizations, Dec. 31, 1940

	Membership	Membership increase over 1939	No. of Posts	Increase in Posts over 1939	No. of Units	No. of Squadrons	Increase in Squadrons over 1939	No. of Voitures	No. of Salons
American Legion	1,078,119*	45,130	11,715	124	..	..	..	..	..
American Legion Auxiliary	504,299*	21,649	..	..	9,147	..	..	..	..
Sons of the American Legion	66,840	5,823†	..		.	3,450	191	..	..
The Forty and Eight	43,594*	2,793	..		.	..	..	700	..
The Eight and Forty	7,258*	3	.	.		.	.	..	277

*New high. †Decrease.

National headquarters of the American Legion, and of its affiliated organizations, the American Legion auxiliary, the Forty and Eight, and the Sons of the American Legion, remained at the War Memorial building, Indianapolis. The Eight and Forty has headquarters elsewhere in Indianapolis. Frank E. Samuel, national adjutant, and principal administrative officer of the American Legion, was re-elected by the national executive committee at its meeting in Boston, immediately following adjournment of the national convention. (M. J. W.)

American Library Association, the official organization of librarians in the United States and Canada, consists of librarians, library trustees, and others interested in libraries. Founded in 1876, it functions through a headquarters staff of over 85 persons and through 600 members of 70 voluntary boards and committees. International in character from its beginning, the association had representatives from every major country in its 1940 membership, which numbered 16,000.

The oldest and largest association of its kind, it is affiliated, formally or informally, with more than 50 other library associations in the United States and other countries and many national and international educational, civic and patriotic organizations and associations. Essae M. Culver, Baton Rouge, La., was president in 1940 and Carl H. Milam, executive secretary. The A.L.A. headquarters is located at 520 North Michigan avenue, Chicago.

Complete and adequate library coverage for the United States and Canada is one of the chief objectives of the A.L.A. In 1940 approximately 47,000,000 people in the two countries—most of them in rural areas—were without access to public library service. Other important objectives are: "to assist libraries to operate with the utmost economy and efficiency; to improve the status of librarianship; to build for the future of library service by drawing into the profession some of the best qualified young men and women; and to promote studies which will tend to establish on a solid foundation the library's place in the governmental and social structure."

Standards of training for librarians are set by the association and a free employment service is offered to libraries and individual librarians. The total income for the fiscal year was about $372,000. The association's endowment was (Aug. 31, 1940) approximately $2,152,000.

Six periodicals are issued by the association: *A.L.A. Bulletin,* a monthly which includes the annual reports, the conference proceedings, and the yearly handbook; the *Booklist,* a semi-monthly guide to the selection and purchase of current books; the *Subscription Books Bulletin,* a quarterly presenting critical estimates of subscription books and sets sold currently by canvassing agents; the *Journal of Documentary Reproduction,* a quarterly giving developments in microphotography and related techniques; *College and Research Libraries,* a new quarterly, the official publication of the Association of College and Reference libraries; and the *Hospital Book Guide,* a new quarterly, sponsored jointly by the Hospital Libraries committees of the American Hospital association and the A.L.A. In addition, the association published 29 professional books and pamphlets during 1940; a few outstanding titles include: McDiarmid's *The Library Survey;* Horton's *Buying List of Books for Small Libraries,* 6th ed.; Branscomb's *Teaching with Books;* Shaw's *List of Books for College Libraries, 1931–38;* Wilcox's *Manual on the Use of State Publications,* and six book lists to be used in conjunction with the national defence program.

Over 3,000 librarians and friends of libraries from the United States, Canada and other countries attended the 62nd annual

A.L.A. conference held in Cincinnati, May 26 to June 1, 1940 when 58 awards were made. James Daugherty received the 19th Newbery medal, for the most distinguished contribution to children's literature published during 1939, for his book, *Daniel Boone;* Ingri and Edgar Parin d'Aulaire won the third Caldecott medal for their distinguished picture book, *Abraham Lincoln;* 52 librarians were cited for outstanding examples of special library publicity issued during 1939; and the editors of the *Christian Advocate,* the *Christian Science Monitor, Scholastic Magazine* and *This Week* were commended for distinguished service during the year in interpreting the library to their readers. Honorary membership was conferred upon Dr. Frank Pierce Hill, a past president of the A.L.A. and member of the association since 1883 and Dr. Herbert Putnam, twice president of the association and librarian of congress for 40 years. The 1940 midwinter conference was held in Chicago, Dec. 27 to 30 and the annual conference was scheduled for Boston, June 19 to 25, 1941.

Library developments during 1940 included: continuation of support of legislation for federal and state support of libraries; reorganization of the A.L.A. through revision of its constitution and bylaws; direction of a Rockefeller foundation grant for a three-year project providing U.S. books for selected popular libraries in Denmark, Eire, England, Finland, France, the Netherlands, Norway, Sweden and Switzerland and a grant for a three-year project covering work and studies on library co-operation with Latin America; adoption of a policy statement on "Libraries and the War in Europe"; co-operation with other groups in behalf of national defence and democracy; collaboration with a national broadcasting company on programs which are broadcast to Canada and Latin American countries with scripts in Spanish as well as English; publication of lists of Portuguese and Swedish books; making of library surveys; observance of the world-wide celebration during 1940 of the 500th anniversary of Gutenberg's invention of movable type and collection of books for the college and university libraries in the interior of China. (M. O. P.)

American Literature. The year 1940 had several notable features, the most striking of them the large number of established novelists who produced works of greater or less magnitude. Also noticeable in the field of fiction was the continued popularity of the historical novel, the only discernible trend at present. Nostalgia for rural and small-town life of the past, which got under way in 1939 with the success of Bellamy Partridge's *Country Lawyer,* spawned shoals of books that might have been lumped under the general title *Life With Father,* needing only sub-titles to explain their exact nature. There was a noteworthy increase in the number of books about South America, the first wave of a tide set in motion by war-born Pan-Americanism.

The event of the year in the novel was the comeback of Ernest Hemingway, whose *For Whom the Bell Tolls,* published in the autumn, was the champion best seller and seemed destined to touch the million mark before its sale ended. A tale of the Spanish Civil war, it was by universal agreement the best work of its author, and quite good enough to wipe out the memory of his failure in *To Have and Have Not.*

A Farewell to Arms appeared to be the only one of his previous books with which it could be compared in stature, and while its love story was no more than conventional, its pictures of men and women at war, in imminent and constant peril, were unforgettable, and its close-to-the-bone account of the life of a young American in the Loyalist service was vivid to the last degree.

The last bit of evidence in the case of Thomas Wolfe was handed to the jury with the publication of the second of two posthumous novels, *You Can't Go Home Again.* Many reviewers saw in it evidence that Wolfe was well on his way to bridling the tornado and saddling the tempest, and it was, indeed, a more quietly written and much better organized novel than its predecessors. But its subject matter remained strictly autobiographical, and, like all the other Wolfe books, it was both very good and very bad. What this gifted writer might have accomplished will always remain a subject of controversy, although what he left behind may be measured without embarrassment against the whole body of work of any other American novelist, living or dead.

Willa Cather, silent since *Lucy Gayheart,* which most of her admirers considered one of her poorest books, turned backward to her native Virginia for *Sapphira and the Slave Girl,* a cool and delicate and skilfully simple story of ante-bellum days in the Old Dominion. It was decidedly Miss Cather's best novel since *Death Comes for the Archbishop,* and in some respects nearer to the true novel than that beautiful idyll. A few critics rated it slightly below the best of her earlier books, but the general inclination was to place it among the top three or four, in spite of the obvious weakness of the ending.

THE GLORY OF CONCORD, Mass., U.S. literary shrine where Hawthorne, Thoreau, Emerson and the Alcotts made their homes, was recalled by Van Wyck Brooks's scholarly *New England: Indian Summer,* published in 1940

No single book blanketed the field of non-fiction in 1940, although Anne Lindbergh's plea for peace, *The Wave of the Future,* swept the country and aroused violent controversy as a reputed argument for appeasement, at a time when the war spirit was rising higher by the hour. Van Wyck Brooks's *New England: Indian Summer,* a sequel to *The Flowering of New England,* also enjoyed widespread popularity and found a warm critical reception. There were some outstanding events in history and biography, but the production here fell somewhat below the average level. The swift movement of events in Europe and the narrowing of the international scene to the conflict between Great Britain and the axis partners wiped out the market for books on world affairs in general. All-out war efforts in the United States had not gone far enough when the year ended to produce a literature, except for a sprinkling of manuals on *How to Become a Soldier.*

In history, the event of the twelve-month was the publication of a five-volume *Dictionary of American History,* edited by James Truslow Adams, and containing contributions on virtually every subject under the sun from the pens of leading authorities, a very complete and up-to-date set.

Among biographies the most important was Allan Nevins's *John D. Rockefeller: The Heroic Age of American Enterprise,* a fair-minded appraisal in two volumes of the founder of Standard Oil. The indefatigable Dr. Nevins appeared to have unearthed all the facts and to have been steadfastly determined not to allow any prejudice to creep into his pages. One left-wing critic called the book "an academy portrait" and others thought Dr. Nevins's knowledge of economics insufficient to fit him for final judgment of Rockefeller and his works, but none failed to praise him for his scholarship, his good writing and his objectivity.

The year was not at all notable in poetry, although it brought a fine volume from Elizabeth Madox Roberts, the first in several years, *Song of the Meadow.* Edna St. Vincent Millay's *Make Bright the Arrows* consisted of topical verse that often descended to the level of commonplace prose, while Muriel Rukeyser's *A Turning Wind* marked no advance over her previous work, and Frederic Prokosch's *Death at Sea,* greatly influenced by Auden, was often effective without ever attaining any real heights. Creditable enterprises in the translation of Spanish poetry were the publication of two volumes, Federico Garcia Lorca's *The Poet in New York,* and Pedro Salinas's *Truth of Two.* Rolfe Humphries translated the former, the work of Spain's greatest contemporary poet and playwright, who was assassinated by followers of Franco, and Eleanor Turnbull the latter. Also there was published *The Selected Letters of Edwin Arlington Robinson,* a revealing collection of interest to all lovers of Robinson's poetry.

Novels.—Kenneth Roberts, by now the leader in the popular field of the historical novel, produced one of his major works in *Oliver Wiswell,* which also promised as the year ended to be one of his most popular books. A story of the revolution with a Tory hero, it again gave evidence of Mr. Roberts's sturdy independence of point of view, his notable ability at vividly recreating the past, his thorough scholarship and the all-around readability of his work. Although *Oliver Wiswell* was beyond question the outstanding historical novel of the twelve-month, it had an abundance of company and there was no sign of any abatement of the nation's burning interest in its past.

Among some of the better books in this crowded category were Lella Warren's *Foundation Stone,* a long and lively, if not very well written, story of early days in Alabama; Iola Fuller's *The Loon Feather,* with a charming Indian girl for its heroine, the daughter of Tecumseh; Van Wyck Mason's *Stars on the Sea,* a rousing yarn of the early days of the navy; Neil H. Swanson's *The Silent Drum,* a unit in a tremendous historical panorama Mr. Swanson is engaged upon, and unusually good reading; Helen Todd's *A Man Named Grant,* a notable attempt at portraiture in fiction; Bruce Lancaster's *For Us the Living,* with Lincoln as the central figure; and Walter Van Tilburg's *The Ox-Bow Incident,* a relatively slight but very skilful story of cattle rustling, which was popular.

Others from a long list that deserve special mention include John Erskine's *Give Me Liberty,* with Patrick Henry as its hero; Clark McMeekins's *Show Me the Land,* early days in Kentucky; Archie Binns's *Mighty Mountain;* Laura Krey's *On the Long Tide;* Mildred Walker's *The Brewer's Big Horses;* Inglis Fletcher's *Raleigh's Eden;* Stewart Edward White's *Wild Geese Calling;* Harold Sinclair's *Westward the Tide;* Louis Zara's *The Land Is Ours;* Evelyn Eaton's *Quietly My Captain Waits;* Conrad Richter's *The Trees;* Walter D. Edmonds's *Chad Hanna;* Isabel Paterson's *If It Be Fair Weather;* and Gwen Bristow's *This Side of Glory.*

To return to the matter of established novelists and their current productions, William Faulkner's *The Hamlet,* a novel of poor whites, the Snopses, was much better than its immediate predecessor, *The Wild Palms,* although it showed no particular advance for Mr. Faulkner's art otherwise. Some of the characters' names sounded like burlesques. Erskine Caldwell's *Trouble in July,* his first novel for some time, was of no especial importance, while Sinclair Lewis's story of the theatre, *Bethel Merriday,* left the author of *Main Street* with his reputation unredeemed from the flat failure of *The Prodigal Parents.* Pearl S. Buck's *The Other Gods,* obviously based on the Lindbergh story, was one of her minor works, but proved that she can write worthy American novels; Louis Bromfield's *Night in Bombay* was second rate and popular Bromfield; while Upton Sinclair's *World's End,* one of the most popular of all Mr. Sinclair's many novels, was a well put together propaganda story of the World War of 1914–18, enlivened with innumerable anecdotes and very readable, if not very important as literature. Hans Otto Storm's *Count Ten,* cut to the biographical pattern, was a larger novel, and a fuller, richer one, than Mr. Storm's previous efforts, which have won him many admirers.

Another event of the year was the return of Glenway Westcott with a novelette called *The Pilgrim Hawk,* his first piece of long fiction in many years, or since *The Grandmothers,* and a brilliant tour de force that promised well for the second stage of this talented writer's career, which came to a curious and abrupt halt after a most striking beginning.

Among the younger novelists, Richard Wright, a Negro, scored a smash hit with *Native Son,* the story of a Chicago boy driven to crime and eventually to death by racial discrimination. A melodramatic theme, which was handled with a good deal of skill, helped to put the book over, although it was hardly so successful as an artistic achievement as Mr. Wright's long short story volume, *Uncle Tom's Children.* Carson McCullers's *The Heart Is a Lonely Hunter* was the most discussed first novel of the year, and a strangely mature and original book to have been written by a young woman of 22.

James Still's *River of Earth* was a simply told and moving story of mountain folk, and Jesse Stuart made a good job of somewhat similar material in *Trees of Heaven.* James Street's *Oh, Promised Land* marked an impressive beginning of a career as an historical novelist, and others of the younger writers who produced creditable books included Paul Corey, with *The Road Returns;* James Robert Perry, with *God Rides a Gale;* Dan Wickenden, with *Walk Like a Mortal;* and Wallace Stegner, with *On a Darkling Plain.* Two noteworthy novels by young writers of Italian descent, concerned with Italians in this country, were *Dago Red* by John Fante, and *Olives on Apple Trees* by Guido Agostini. Kay Boyle's book of short stories, *The Crazy Hunter,* had great distinction

AMERICAN AUTHORS of successful books in 1940: Van Wyck Brooks *(New England: Indian Summer)*; Kenneth Roberts *(Oliver Wiswell)*; John T. Flynn *(Country Squire in the White House)*; Mortimer J. Adler *(How to Read a Book)*; Ernest Hemingway *(For Whom the Bell Tolls)*

and was the most notable collection of its kind. William Saroyan's *My Name Is Aram* was another collection worth noting.

Biography.—Aside from Dr. Nevins's life of John D. Rockefeller, the year was not noteworthy in lives of great Americans, although it produced Claude M. Fuess's *Calvin Coolidge: The Man from Vermont;* George S. Hellman's *Benjamin N. Cardozo: American Judge;* John K. Winkler's *Five and Ten: The Fabulous Life of F. W. Woolworth;* Stewart Holbrook's excellent *Ethan Allen;* Ola Elizabeth Winslow's *Jonathan Edwards;* and *O. L. Marsh: Pioneer in Paleontology,* by Charles Schuchert and Clara Mae La Vene, the life story of the man who introduced dinosaurs to the great American public. The list shows that there was at least no lack of variety. Nathaniel Wright Stephenson's two-volume *George Washington* and Bernard Knollenberg's *Washington and the Revolution* were two important contributions to the study of the father of his country, the latter somewhat iconoclastic, especially in its attacks upon other historians, but both destined to take a lasting place on the Washington shelf. A biography of a little known but highly important member of the Lincoln circle in Washington was Marjorie Barstow Greenbie's *Dear Lady: The Story of Anna Ella Carroll.* Mrs. Carroll, it seems, was a southern woman who played a tremendous part in the Lincoln administration, although her name does not even appear in histories of the period.

The list of autobiographies is more impressive in quality. It contains Hans Zinsser's *As I Remember Him: The Biography of R.S.,* a fine book about a scientist who died shortly after it was published; Abraham Flexner's *I Remember,* the story of great foundations and their work; *The Confessions of an Individualist* by William Henry Chamberlin, one of the best of living foreign correspondents; Ernest Thompson Seton's *The Trail of an Author-Naturalist;* Alice Hegan Rice's *The Inky Way;* and *Dusk of Dawn* by W. E. D. Du Bois, the stirring life story of a great Negro educator and publicist.

History.—There were a number of additions to the flourishing *Rivers of America* series during the year, and a new series of informal histories of the states got under way with Phil Stong's *Hawkeyes,* done in his best vein and making a good start for an interesting project. Foster Rhea Dulles's *America Learns to Play: A History of Popular Recreation,* told the country's story through its games, with pictures, while David L. Cohn's *The Good Old Days* did the same thing through the medium of Sears, Roebuck catalogues.

Frederick Lewis Allen continued his informal history of our own times with *Since Yesterday: The 1930's;* Fred Lewis Pattee covered a period of our literary history in his *The Feminine Fifties;* and Ernest Sutherland Bates, who died shortly after the book was published, made a fine contribution in his *American Faith: Its Religious, Political and Economic Foundations.* Two new books written around Lincoln were George S. Bryan's *The Great American Myth,* a painstaking exploration of the facts concerning the assassination and its sequels; and Otto Eisenschiml's *In the Shadow of Lincoln's Death,* which revived all the odd and curious rumours afloat at the time and gave much more credence to most of them than they deserve.

Coronado's Quest by A. Grove Day told anew the story of the discovery of the southwestern states by the Spaniards, with a wealth of detail and in a readable style. Edmund Wilson's *To the Finland Station* was a brilliantly written history of socialism, interlaced with biographies and containing a section devoted to Lenin and Trotsky. The subtitle was *A Study in the Writing and Acting of History,* and the book proved to be an exciting intellectual adventure.

Nostalgia.—This heading covers a whole assortment of books about the back country past and includes volumes about editors, horse doctors, lawyers, preachers and schoolteachers, written mostly by fond sons who have found family memories a surprising source of revenue. Others are by living practitioners of the art of living in the country, and liking it. This long list includes among its better selections, Henry Beetle Hough's *Country Editor,* Clayton Rand's *Ink on My Hands,* and Joshua K. Bolles' *Father Was an Editor,* to begin with journalism; *One Foot in Heaven: The Life of a Practical Parson* by Hartzell Spence (son), and George B. Gilbert's *Forty Years a Country Preacher; The Doctor and His Patients* by Arthur B. Hertzler; *Frontier Doctor* by Wiling C. Coe; *Hoss Doctor: The Memories of a Country Vet* by R. J. Dinsmore; and *Horse and Buggy Daze* by Irving B. Tressler, a spoof on the fad. Also *Schoolmaster of Yesterday* by Millard Fillmore Kennedy and Arthur F. Harlow; *Family Crisis* by Sherlock Bronson Gass, whose family once ran a laundry; *How Dear to My Heart* by Mary Margaret McBride; and last, but not at all least, Rebecca Yancey Williams' *The Vanishing Virginian,* which is *Life with Father* on the other side of the Mason and Dixon line, and a delightful portrait of a Virginia gentleman of the old school, done by his daughter.

Pan-America.—The rapid development of a closer relationship between the United States and Central and South America was evidenced in the number of books published concerning Pan-Americanism as a working doctrine. Among the best of these was Duncan Aikman's *The All-American Front,* revised during the year, and giving a complete survey of the South American situation as viewed by a shrewd reporter; Mr. Aikman was under no delusions about the difficulties of closer relationships with the sister republics, but thought the United States should make an intelligent effort, and tried to point the way without being dogmatic. Carleton Beals's *Pan-America* was another well informed volume on the same subject, although written with a more definite bias than Mr. Aikman's book, and therefore to be read more critically.

Vera Kelsey's *Seven Keys to Brazil* was a complete and readable study of the southern hemisphere, while Anne Merriman Peck's *Round About South America* again told the story cheerfully and attractively. Gregory Mason's *South of Yesterday* was a book of travel and archaeology, full of fresh information delightfully imparted; Ernest Young's *South American Excursion* was a travel book with much good descriptive writing in it; and Edwin F. Embree's *Indians of the Americas* gave part of its space

to the aborigines of other lands than the United States. Paul Russell Cutright's *Great Naturalists Explore South America* was of much wider interest than the merely scientific; and William Merriman's *Yankee Caballero* had several extraordinary stories of adventure in out of the way places in the Andes and up the Amazon.

As 1940 ended, reports were that North American writers were leaving in large numbers for South America, all of them intending to write books about it, and there were many plans underway for an exchange of the literary productions of the two hemispheres. A good novel based on life in two republics, probably Haiti and Santo Domingo, published as the year drew its last breath, was Harold Courlander's *The Caballero*. (*See* English Literature.)

(H. Bl.)

American Medical Association. The American Medical association, founded in 1846 in Philadelphia, Pa., celebrated its 94th anniversary at its most successful annual meeting in June 1940 in New York city with an attendance of 12,864 physicians. The technical and scientific exhibits completely filled the Grand Central palace and the scientific sessions taxed the capacities of large meeting rooms where the newest advances of medicine and surgery were presented by distinguished experts. At the opening evening meeting a large audience was entertained by a symphony orchestra composed of 70 physicians.

The house of delegates, which is the policy-making body of the association and made up of representatives from every state and from the territories of Alaska, Puerto Rico, Canal Zone, Hawaii and the Philippines, was confronted with unusual problems growing out of the European war. The United States war department asked the help of the American Medical association in preparing for national defence, and the speaker was authorized to appoint a committee on medical preparedness, representing every military corps area.

The committee sent questionnaires to 175,000 physicians to discover how loyal, how willing and how available they might be. The response of more than 134,000 physicians exhibited the traditional devotion of the medical profession to public service. The skeletal fabric for military service was erected in every state, not only for field service and service in draft boards, but for the protection of civilians at home.

On Sept. 19 President Roosevelt appointed a health and medical committee of the council on national defence, composed of Dr. Irvin Abell, a former president of the American Medical association, chairman; the surgeons general of the army, the navy and the public health service; and Dr. Lewis H. Weed, chairman of the division of medical sciences of the National Health council. This committee was asked "to survey and co-ordinate the medical resources of the country in the interest of national defence." On Dec. 3 Paul V. McNutt, Federal Security administrator, was designated a "co-ordinator of all health, medical, welfare, nutrition, recreation and other related fields of activity affecting the national defence." This naturally transferred the work of all medical preparedness to one leadership.

Every activity of the association grew during 1940. The membership increased to 116,524; the circulation of the *Journal* to 101,323 weekly, and all the special *Journals* showed an increased number of subscribers.

Hygeia, designed for popular reading, brings timely developments in practical medical knowledge in lay language and reached in 1940 a reading public (estimated according to a recent survey) of approximately 2,000,000 persons.

The American Medical association is an educational institution. Through its council on medical education and hospitals it continued to exert the strongest influence in the U.S. to maintain the highest standards of medical education and the very best quality of medical service to hospital patients.

Its radio broadcasts carry proven medical information to all listeners. The association's continued efforts to educate all the people to resist the seductions of quackery has resulted in the flight from this field of some of the most conspicuous offenders. Some of these people brought legal actions against the association, but all were defeated.

More than 7,000,000 people visited the Hall of Health at the world's fair in New York city where an educational exhibit sponsored by the association was a leading attraction.

The woman's auxiliary of the American Medical association, with a membership limited to the wives of physicians, grew to 25,000 in 1940 and was organized in 38 states. Its objectives are educational through local and national public relations committees; the distribution of hygiene; the promotion of local and national health projects; and improvement of the social relations of all physicians. (N. B. V. E.)

American National Red Cross: *see* Red Cross.
American Newspaper Guild: *see* Newspapers.
American Samoa: *see* Samoa, American.
American School of the Air: *see* Education.
American Society of Composers, Authors and Publishers: *see* Advertising: *Regulation and Ethics;* Music, Popular; Radio, Industrial Aspects of: *Musical Property.*
American Youth Congress: *see* Youth Movements.
Ameripol: *see* Chemistry: *Synthetic Rubber;* Rubber and Rubber Manufacture.

Anaemia. In 1939–40 increased attention was directed to the preservation of blood, plasma and serum for therapeutic purposes. Stored blood is inferior to fresh blood in the control of bleeding in jaundice (loss of prothrombin). Haemoglobin intravenously is nontoxic and increases blood haemoglobin quickly in emergencies. Further studies were made of vitamin K and synthetic substitutes in relation to haemorrhage. (Hypoprothrombinaemia; haemorrhagic disease of the new born.) Vitamin P does not alter fibrinogen, prothrombin or platelets, but is curative in vascular purpura. Female anaemic rats utilize ingested iron more efficiently than anaemic males. Cobalt appears to enhance the utilization of simultaneously ingested iron, accelerating erythropoiesis.

In milk anaemia in dogs, iron and copper mixtures are three times as effective as iron alone. Ingested, radioactivated iron appears in the red blood cells of anaemic dogs within four to eight hours. It is converted into haemoglobin in two to seven days. There is no exchange of iron types in *in vitro* mixtures with blood. Multiple small doses of iron are more efficient than single large doses.

Egg yolk is effective in erythropoiesis, but fish roe requires the addition of lactoflavin to be of value. Of the amino acids, glycine, glutamic acid, aspartic acid, cystine, histidine, phenylalanine and prolin are the most active in producing haemoglobin in anaemia. A blood iron concentration below 20 mg. per 100 c.c. is of bad prognostic import. Haemolysins, intraperitoneally, induce a spherocytic anaemia in dogs, with increased fragility of the erythrocytes.

Nonacid secreting relatives of patients with pernicious anaemia are susceptible to the disease. The familial incidence is 7·9%. Gastric carcinoma is more common in these patients (3·86%) than in the general population (·3%). Patients receiving a year's supply of liver extract, intramuscularly, within one week, relapse in from 2 to 12 months. The optimal frequency of dosage is one to four weeks.

There appears to be no evident correlation between the pH of gastric secretions, the gastroscopic appearance of the mucosa, the presence or absence of a secretory depressant factor in the secretion and the blood count in pernicious anaemia. The erythrocyte increase after two weeks of therapy in pernicious anaemia is 0·78–0·174 E o (E o = initial erythrocyte count).

The electrocardiographic records in anaemia show low voltage. A familial, hereditary, haematopoietic disorder in Italians is characterized by hypochromic, microcytic erythrocytes with increased resistance to salt solutions, splenomegaly, bilirubinaemia and urobilinaemia.

In benzene poisoning, aplastic anaemia is more frequent in man than in animals. Anaemia is common in benzol poisoning in the rotogravure industry. Acute haemolytic anaemia may characterize naphthalene poisoning. A mild, slowly developing haemolytic anaemia (fall of 20% in haemoglobin in the first ten days) occurs in 3% of adults treated with sulphanilamide.

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Anaesthesia. The advances in anaesthesia during the year 1940 were few. One of the most important was the introduction of the Horton intercoupler, a device by which static electricity, which might cause explosions in the gas machine, is brought under relatively good control. This device is a series of wires intercoupling the anaesthetist, the table and the gas machine with a resistance of 1 megohm, which prevents the static electricity from travelling from one object to another rapidly enough to cause a spark. With this device available, the use of cyclopropane, ethylene and other explosive mixtures of anaesthetic agents has been brought reasonably well under control. These gases are being used with more confidence than before. Further investigations of the properties of cyclopropane have established the fact that otherwise explosive combinations of cyclopropane and oxygen may be made nonexplosive by dilution with inert gases such as helium, nitrogen and air. Romberger and his associates worked out the problem and concluded that there are conditions under which cyclopropane is not explosive when combined with nitrogen or air. Even mixtures of cyclopropane and ethylene have been found by Horton and others to be less explosive than either agent alone.

A valuable contribution was made by Lemmon, who suggested the use of what he called "continuous spinal anaesthesia." This is made possible by the use of a very soft needle that will not break and by connecting to it a small firm rubber tube about 2 feet (61 cm.) in length, through which a solution of procaine hydrochloride or any other spinal anaesthetic may be injected from time to time.

This method permits long anaesthesia to be provided by procaine, which is no doubt the safest of all the spinal anaesthetic agents. It shows how valuable a contribution may be that permits a new and better use of an old and well established anaesthetic agent.

While intravenous anaesthesia was not new in 1940, its use spread considerably. In addition it has been used in combination with other agents and older methods with very satisfactory results to the users. It has been particularly valuable in connection with nitrous oxide and oxygen where noninflammable mixtures had to be used.

The agents pentothal sodium and evipal soluble are still the best of the local anaesthetic agents for intravenous use. Pentothal sodium seems to be the more popular of the two. The patients almost universally prefer these drugs for general anaesthesia to those given by general inhalation. Therefore, physicians often are encouraged to use this method in all operations regardless of the age of the patient. This use does not always ensure the greatest safety for the patient where the intravenous anaesthetic alone is depended on to provide all the necessary anaesthesia and relaxation that the surgeon needs. In some cases the attempt has been made to administer oxygen simultaneously with the intravenous anaesthetic because, when anaesthesia is deep, respirations are shallow and it has not been possible to safely provide profound enough anaesthesia by the intravenous method when patients inhale air. However, it has been possible to do so safely when the patient is inhaling oxygen.

Most anaesthetists do not care to push administration of the intravenous anaesthetic alone to such a point, since it may be combined to advantage with regional anaesthesia, inhalation anaesthesia and even rectal anaesthesia. These combinations will probably prove to be mutually advantageous; so it is to be hoped that they will be the means of a greater use of regional anaesthesia and at the same time relieve the patient of any memory of the injection of the local anaesthetic which has handicapped its use in the past.

It seems generally conceded that preliminary medication may be used to advantage before intravenous as well as before inhalational anaesthesia. There is reason to think that the use of barbiturates such as pentothal sodium prior to the administration of such a gas as cyclopropane gives the patient some protection against cardiac disturbances during cyclopropane anaesthesia.

It is generally conceded that the use of a 2·5% solution of pentothal sodium is better than the use of a 5% or 10% solution from the standpoint of prevention of thrombophlebitis. Many mechanical devices have been prepared for the administration of the drug after the needle has been fastened into the vein so that one individual may attend the patient's head as well as inject the solution into a vein in an extremity. The opinion has been freely expressed that the intravenous method will find extensive military medical uses.

Another activity in the field of anaesthesia that was not exactly new in 1940 was the aspiration of material from the tracheobronchial tree during and after operation. Where atelectasis occurs as a result of the occlusion of a bronchus by a plug of mucus or other material, the relief of the condition is sudden and dramatic when the material has been aspirated from the tracheobronchial tree through either a laryngoscope or a bronchoscope. The use of a bronchoscope entails much more experience and practice than the use of a laryngoscope.

While the method was not new in 1940, nevertheless much progress has been made in demonstrating its value, and it, too, is being more widely used than before, although progress in this direction is slow. (*See* also SURGERY.)

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Anderson, Mary (Madame Antonio F. de Navarro) (1859–1940), U.S. actress, was born in Sacramento, Calif., July 28, and died in Broadway, England, May 29. For a biographical sketch see *Encyclopædia Britannica,* vol. 1, p. 899.

Andrews, Charles Freer (1871–1940), English missionary in India, was born in Newcastle-on-Tyne, England, Feb. 12. He was educated at Pembroke college, Cambridge, and in 1896 went to London as the head of the Pembroke college mission to the slums. He went to India in 1904 to join the Cambridge Brotherhood at Delhi and was made a fellow of Punjab university in 1908. He became a close friend of Gandhi and co-operated with him in an attempt to bring about harmonious relations with the British. He became connected with Rabindranath Tagore's institute at Santiniketan, 100 mi. from Calcutta, in 1913 and was its president when he died. He was active in the settlement of the problem of Hindu labour in South Africa and in British Guiana. He wrote a biography of Gandhi and two other books dealing with his ideas and plans, as well as several books on the Christian religion. He died in Santiniketan, April 4.

Angling. Three new world's records were set during the 1940 salt-water season. The most outstanding of these was the new record broadbill swordfish which was caught by E. S. Tuker at Tocopilla, Chile. This huge broadbill, which weighed 860lb., made Mr. Tuker the record holder for the second time in his angling career. He first established the broadbill record in 1933 with an 837½-pounder, but was displaced by his fishing partner, G. W. Gary, who caught an 842-lb. broadbill in 1937. Tuker regained the world's record when he landed the 860-pounder on April 28, 1940.

The giant bluefin tuna world's record was broken for the third time in two years when Dr. John B. Vernaglia landed a 927-lb. specimen at Ipswich bay, Mass., on Aug. 25, 1940. The record had been broken twice in 1939, both times by tuna caught in Nova Scotia waters. Dr. Vernaglia's catch returned the record to the coastal waters of the United States for the first time in a number of years.

The third salt-water record was established at Galveston, Texas, when Ernest Reid caught a 1,302-lb. sawfish on Sept. 1. The sawfish is not considered as a game fish in the same class with the broadbill swordfish or the tuna, but this record is interesting in that it proves what huge fish can be taken on rod and reel.

In addition to these world's records, two important ladies' records were established in 1940. One of these was a 611-lb. broadbill swordfish caught by Mrs. John Manning at Tocopilla, Chile, on July 23. The other was a 792-lb. bluefin tuna caught by Mrs. L. G. Bloomingdale at Wedgeport, Nova Scotia, on Sept. 3.

As far as fresh-water fishermen are concerned, there was only one important record established during the 1940 season. This was a new world's record muskellunge caught by Percy Haver on June 28 in Lake St. Clair, Mich. The muskellunge weighed 62½lb. and is the largest strictly fresh-water game fish ever caught in America. Although a muskellunge record of 58¼lb. stood unchallenged from 1932 through 1938, the weight of this fish has been exceeded five times in the past two seasons. (D. Ho.)

Anglo-Egyptian Sudan. A territory under the joint sovereignty of Great Britain and Egypt in northeastern Africa, south of Egypt. Area 967,500 sq. mi.; pop. (est. 1939) 5,858,317. Chief towns: (pop. 1938) Khartoum (46,676); Omdurman (110,959); Port Sudan (21,773); Atbara (19,757); El Obeid (27,390). Governor-general: Lt.-Gen. Sir Hubert Huddleston; languages: English and Arabic; religion: Mohammedan.

History.—After the entry of Italy into the European war in June 1940, the Sudan took an active part in hostilities. Thousands of refugees from Abyssinia offered their services to the government, and on July 22 it was reported that Emperor Haile Selassie had arrived to organize these forces against the Italians. Fighting during 1940 was, however, confined to frontier skirmishes, notably around Gallabat in the Sudan and Metemma in Abyssinia, and to aerial warfare. In the course of a tour of the middle east, Anthony Eden in the autumn visited many parts of the Sudan, inspecting troops and defences, and on Oct. 27 he met General Smuts and General Wavell at Khartoum where the military situation in north Africa and the middle east was reviewed in a series of important conferences.

During 1940 the Emergency Supply committee was reconstituted as the Sudan Resources board to investigate and advise on the manner in which the resources of the Sudan might best be utilized for the benefit of the Sudan, Great Britain and Egypt, and necessary supplies and foreign markets assured.

Although the war brought certain economic problems to the Sudan, satisfaction was felt at the way these had been tackled by all members of the community. In most territories it was not worth while to plan comprehensive or costly programs of educational expansion, because funds could not be allocated in advance, but in the Sudan the fourth year of the approved ten-year plan was carried out without substantial modification. The medical services estimate stood at £300,000, a generous proportion of the total revenue. Adverse weather conditions, particularly the heavy rainfall of the autumn of 1939, caused a considerable decrease in the cotton crop of the Gezira. The usual problem of the disposal of the hold-over had practically disappeared, since nearly all the balances of former crops were disposed of, and despite shipping difficulties fair progress was made with the sales of the 1940 crop.

Education.—Intermediate schools 11, scholars 1,573; higher: secondary schools 465, post-secondary schools 73.

Banking and Finance.—In 1938: revenue £7,574,000; expenditure £7,293,000; public debt (Dec. 31, 1938) £13,873,800.

Trade and Communication.—In 1939 the value of exported merchandise amounted to £E5,367,396, of which cotton accounted for £E3,410,080 and gum £E711,606. Communication: roads, suitable for motor traffic, all weather, *c.* 1,000mi.; railways 1,991 mi.; river service 2,325mi.; motor vehicles licensed (1937) 4,354 cars, commercial vehicles and cycles; telephone subscribers (1938) 2,352.

Agriculture and Mineral Production.—Production: (in metric tons) cotton seed (1938–39) 105,000; ginned cotton (1938–39) 60,000; millet (1937–38) 315,000; sesamum (1937–38) 33,000; maize (1937–38) 10,000; wheat (1937–38) 8,000; groundnuts (1937–38) 8,500; gold (1938) 252 kilograms.

Angola: *see* Portuguese Colonial Empire.
Animal Fats: *see* Vegetable Oils and Animal Fats.
Annam: *see* French Colonial Empire.
Anniversaries and Centennials: *see* Calendar, 1941, page xx.
Antarctic Exploration: *see* Exploration and Discovery: *Antarctic.*

Anthropology, the comparative science of man, has been primarily interested, until recently, in the reconstruction of man's physical and cultural history. However, publications and researches of 1940 in most of the five major fields of anthropology evidenced new and significant trends of interest in other subjects as well. In the brief summary of the year

which follows, the additions to knowledge in the older subjects, as well as the more recent trends in physical anthropology, archaeology, linguistics, ethnology and social anthropology are reviewed.

Physical anthropology was in 1940 showing much interest in human growth studies, constitutional typing, physical inferiority and other problems of human biology. Using a modification of Kretchmer's threefold classification, Sheldon and Tucker were able to classify all human beings according to the proportionate amount of three components occurring in each individual (W. H. Sheldon, W. B. Tucker and S. S. Stevens, *Varieties of Human Physique,* 1940). After studying 17,000 American criminals, Earnest Hooton concluded: criminals are "biologically inferior"; different types of crimes are correlated with interrelated combinations of bodily traits; and when members of different races are criminal they are inclined to commit certain crimes and not others (E. A. Hooton, *Crime and the Man,* 1939). Hooton's revival of the Lombrosian hypothesis in a modern form is the subject of considerable controversy.

In the older field of human evolution and fossil man, the most important development in 1940 was the publication of the physical findings from the caves of Mt. Carmel in Palestine (T. D. McCown and Sir Arthur Keith, *The Stone Age of Mount Carmel II,* 1939). The skeletal material consists of 12 individuals from the Upper Paleolithic. The authors, from the osteological evidence, believe the area is a transitional zone between Neanderthal forms in the west and Proto-Cromagnon in the east. Investigations of recent skeletal material demonstrate that 4,000 years ago the present European physical types had already appeared (W. M. Krogman, "Racial Types from Tepe Hissar, Iran, from the Late Fifth to the Early Second Millennium, B.C.," *Proceedings of the Dutch Academy of Sciences,* vol. 39, no. 2, 1939). There were no new developments during the year on Sinanthropus and Pithecanthropus or on early man in the two Americas. Publications appeared in 1940 on the South African man-apes (W. K. Gregory and M. Hellman, "The Upper Dental Arch of Plesianthropus Transvaalensis Broom, and Its Relations to Other Parts of the Skull," *American Journal of Physical Anthropology,* vol. 26, pp. 211–28, March 1940, and R. A. Dart, "The Status of Australopithecus," *American Journal of Physical Anthropology,* vol. 26, pp. 167–86, March 1940).

Trends in archaeology are towards greater collaboration with the ethnologists and historians to interrelate recorded history and the testimony of the excavators. The increasing use of dendrochronology for greater accuracy in dating (Dr. Florence Hawley in the Mississippi valley and a large number of archaeologists in the southwest) is an example of the effective use of a borrowed technique in archaeology. In the United States, work continued with its usual intensity in the southwest (J. O. Brew, "Preliminary Report of the Peabody Museum Awatovi Expedition of 1937," *American Antiquity,* vol. 5, no. 2, 1939) and in the upper Mississippi valley. The relations of middle America to North and South America were receiving increasing attention (C. Hay, R. Linton, S. K. Lothrop, H. L. Shapiro and G. C. Valliant [eds.], *The Maya and Their Neighbors,* 1940). Two North American areas, until recently relatively quiescent, were in 1940 very active; in New England, under the leadership of Douglas Byers of Andover academy, a large number of excavations were made, and, in the southeast, stimulated by government financing and new interest in the state universities and museums, extensive excavations gave evidence of cultural sequences ranging from simple hunting and gathering people to highly developed towns. Further generalizations on archaeological results from the principal areas of North America ("Essays in Historical Anthropology in North America, Published in Honor of John R. Swanton," *Smithsonian Miscellaneous Collections,* vol. 100, 1940) and from the Andean region of South America appeared (W. C. Bennett's "Archaeology of the Northern Coast of Peru: An Account of Exploration and Excavation in Viru and Lambayeque Valleys," *Anthropological Papers,* no. 37, 1939).

THE FIRST DEFINITIVE STUDY of the Negroids of Bougainville in the Solomon islands, heretofore anthropological mysteries, was announced in March 1940 by Dr. Douglas Oliver of the Peabody museum, Harvard. The photograph shows a marriage ceremony in midstream. Groom and bride squat with bridesmaid between them

Reports indicated that little or no archaeological or ethnological work was done in warring Europe; but English anthropologists were active in other parts of the empire, particularly in Africa. The Russians continued their activities within their own borders (H. Field and E. Prostov, "Archaeological Researches in the U.S.S.R., 1938–39," *American Anthropologist,* vol. 42, no. 2, part 1, pp. 211–35, April-June 1940).

There were no major developments in linguistics, but field workers were active, studying native languages in most of the major areas of the world, and there was an increasing tendency to investigate problems of meaning and communication and the relations of these two subjects to social behaviour.

The range of subject matter of ethnology and social anthropology was being constantly extended. At the one extreme, an increasing number of studies were made on modern society, and, at the other, the ideological and methodological groundwork was laid for research on the social life of the other primates (S. Zuckerman, *Social Life of Monkeys and Apes*). Evidence continued to accumulate indicating that the ape and monkey societies are only more extreme varieties of our own kind of social behaviour and function biologically and adaptively very much as ours does. Hart (C. W. M. Hart, "Social Evolution and Modern Anthropology," *Essays in Political Economy in Honor of E. J. Vrurick*), among others, made the point that if social anthropology adds these simple organizations to one extreme of the range of social complexity and complex modern civilizations to the other, the problems of social evolution must once more be considered. Three or four decades of concerted attack on social evolution as a working hypothesis may fail and become significant only as a criticism of the unilateral theories of Morgan and similar writers.

During the year, anthropological knowledge of primitive social

institutions was considerably advanced; this was particularly true of political and economic organizations (J. J. Herskovits, *The Economic Life of Primitive Peoples,* 1940, and A. I. Richards, *Land, Labor, and Diet in Northern Rhodesia,* 1939). Other additions to comparative economics came from such diverse areas as New Guinea (H. I. Hogbin, "Native Land Tenure in New Guinea," *Oceania,* vol. 10, no. 2, pp. 113–65, Dec. 1939), western Asia (E. R. Leach, "Social and Economic Organisation of the Rowanduz Kurds," London School of Economics and Political Science, *Monographs on Social Anthropology,* no. 3, 1939), and Polynesia (R. Firth, *Primitive Polynesian Economy,* 1939). The comparative study of governmental institutions was benefited by the publication of a number of studies from Africa and North America (E. E. Evans-Pritchard, "The Political System of the Anuak of the Anglo-Egyptian Sudan," London School of Economics, *Monographs on Social Anthropology,* no. 4, 1940; *The Nuer: A Description of the Modes of Livelihood and Political Institutions of a Nilotic People,* 1940; M. Fortes and E. E. Evans-Pritchard [eds.], *African Political Systems,* 1940; G. T. Hunt, *Wars of the Iroquois,* 1940).

The relation of the social structure to sexual behaviour in the field of the family and kinship was given special attention (researches of Dr. George P. Murdock; I. Schapera, *Married Life in An African Tribe,* 1940; F. L. K. Hsu, "The Problem of Incest Tabu in a Northern China Village," *American Anthropologist,* vol. 42, no. 1, pp. 122–35, Jan.–March 1940). Further documentation of kinship structures was made (A. P. Elkin, "Kinship in Southern Australia," *Oceania,* vol. 10, no. 2, pp. 196–234, Dec. 1939).

The psychology of the individual in non-literate societies was dealt with in a number of studies (W. Dennis, *The Hopi Child,* 1940; M. Mead, "Social Change and Cultural Surrogates," *Journal of Educational Sociology,* vol. 14, no. 2, pp. 92–109, Oct. 1940). Acculturation problems received treatment in several studies on white and Indian contact in North America (R. Linton, *et al., Acculturation in Seven American Indian Tribes,* 1940).

Works of general interest included theoretical analyses of the relation of the individual to society (B. Malinowski, "The Group and the Individual in Functional Analysis," *American Journal of Sociology,* vol. 44, no. 6, May 1939), and studies of ritual, myth and taboo (A. R. Radcliffe-Brown, *Taboo,* the Frazer Lecture, 1939; J. Weckler, *Ritual Status in Polynesia,* being published by the U. of C. press; and R. Firth, *The Work of the Gods in Tikopia,* vols. 1 and 2, 1940). One of the chief contributions to method and to the relation of ethnology to geography was made by Kroeber (A. L. Kroeber, "Cultural and Natural Areas of Native North America," *University of California Publications in American Archaeology and Ethnology,* vol. 38, 1939).

The social anthropology of modern life, one of the newer developments, accumulated an extensive literature, world-wide in scope. Studies of the modern community in eastern Asia (J. F. Embree, *Suye Mura: A Japanese Village,* 1939; and H-T Fei, *Peasant Life in China: A Field Study of Country Life in the Yangtze Valley,* 1939) and in Europe (C. Arensberg, *Irish Countrymen,* 1937, and C. Arensberg and S. Kimball, *Family and Community in Ireland,* 1940). R. H. Lowie's two chapters on European cultures, in the new edition of *An Introduction to Cultural Anthropology,* 1940, were published. Under the leadership of Robert Redfield, a number of researches on modern folk and city societies were being conducted in Latin America (R. Redfield, *Folk Culture in Yucatan,* being published by the U. of C. press). Similar studies were made in Canada and Arizona (H. Miner, *St. Denis: A French-Canadian Parish,* 1939; and E. H. Spicer, *Pascua: A Yaqui Village in Arizona,* 1940).

The results of a number of researches on communities in the United States were published in 1940. Negro-white relations were examined in the southern United States (H. Powdermaker, *After Freedom,* 1939), and identified as a variant form of caste (A. Davis, B. B. Gardner, E. R. Gardner, *Deep South,* being published by the U. of C. press). Social researches were pursued on problems of rank, ethnic acculturation, social change, and symbolic behaviour in a New England community (W. L. Warner, P. S. Lunt, L. Srole, J. O. Low, *Yankee City,* being published by the Yale University press). Personality studies, by use of anthropological and psychological techniques (A. Davis and J. Dollard, *Children of Bondage,* 1940; and W. L. Warner, B. H. Junker, W. A. Adams, *Color and Human Nature,* being published by the American Council on Education) similar to those made in non-literate communities, were undertaken.

(W. L. Wr.)

Anti-Aircraft Weapons: *see* Munitions of War.
Anti-Comintern Pact: *see* Democracy; Fascism; Hungary; Japan.
Antigua: *see* West Indies, British.
Anti-Lynching Legislation: *see* Lynchings.

NEGROIDS of Bougainville in the Solomon islands carrying a wooden gong on a raft across a stream

Antimony. World production of antimony was estimated at 34,000 metric tons in 1939, against 34,500 tons in 1938, a 20% drop from 1937. Continuing decreases in China and Mexico were only partially offset by increases in Bolivia and Yugoslavia. While China once supplied 70% of the demand, Mexico 10% and Bolivia 7%, in 1939 China furnished only 17%, Bolivia 30%, Mexico 23% and Yugoslavia 12%. Until recently, the United States output has been limited to a few hundred tons of by-product metal in antimonial lead, though a smelter has been in operation at Laredo, Tex. since 1931, using Mexican ores. In 1938 a small plant began operation at Los Angeles, using a Mexican ore containing both antimony and mercury, and early in 1940 production of by-product antimony was reported to have been started in Idaho from silver-copper ores. The United States is the largest consumer of antimony taking about half of the world supply of new metal to satisfy two-thirds of its consumption demand, the other third being furnished by secondary metal. A marked feature of the United States consumption is the increase in the demand for oxide, made largely from South American ores and a corresponding decrease in the demand for metal; the demand for oxide has about doubled since 1935. The Chinese industry has been badly disorganized, first by the depression and then by the Sino-Japanese war, exports in 1939 being only 29% of those in 1929 and 40% as compared with 1935. (G. A. Ro.)

Anti-Saloon League of America, Inc. The Anti-Saloon League of America is a nonpartisan, interdenominational organization formed in 1895 for the purpose of temperance education and legislation.

During 1940 the first state which had legalized liquor following repeal of national prohibition reversed its attitude. In an advisory referendum on Aug. 27, South Carolina voted on the question, "Do you favour discontinuing the legal sale of intoxicating liquors, wines, beers and other intoxicating beverages, and the imposition of new taxes to replace lost revenue as a result of the repeal of the present liquor law?" The people voted 189,361 for and 130,366 against repeal of the liquor law, a majority of 58,995 for repeal of the liquor law.

In Oklahoma, on Nov. 5, repeal of the state prohibition amendment was defeated by 374,911 against 290,752 for repeal, a majority of 84,159 on direct vote against repeal of state prohibition. Since a majority of all the votes cast was necessary, repeal of state prohibition failed by 133,134 votes. Returns show a slight increase in the number of no-licence units in elections held during 1940 under local option.

The biennial national convention of the league was held Nov. 24–26, 1940, in Calvary Baptist church, Washington, D.C., the birthplace of the national league. The national board of directors reaffirmed the general program which it had adopted at the biennial convention in Columbus, Ohio, in 1938. The national headquarters are located at 131 B st. S.E., Washington, D.C.

(E. B. Du.)

Anti-Semitism. The violent anti-Semitism which forms one of the fundamental points of the program and activities of national socialist Germany not only continued unabated during 1940, but as a result of the national socialist domination of most of continental Europe it spread to such an extent that it became a problem of unprecedented dimensions. The national socialist government had to adapt its policies accordingly. While in the first five years of the regime emigration of German Jews to outside countries was encouraged, as a means of solving the German-Jewish problem created by the national socialist legislation, the early conquests of Austria, Czechoslovakia and Poland had the paradoxical result of bringing many more Jews

PARIS, long the capital of political and racial refugees, gradually adopted anti-Semitism in 1940 under German domination. The picture shows a "Jews forbidden" sign in a restaurant on the Champs-Elysées

under national socialist domination than there had ever been in Germany. In 1939 the national socialists proposed the creation of a Jewish "reservation" in southeastern Poland, where all the millions of Jews then under national socialist domination were to be concentrated. Although at the end of 1939 a beginning had been made with the transfer of Jews to this reservation and thousands were left there stranded, exposed to certain starvation and inhuman treatment, the plan was abandoned in 1940 as impracticable. With the widening of national socialist control over most of continental Europe, the national socialists envisaged a "solution" of the problem as they understood it by shipping the millions of European Jews to Madagascar, where they would live under strict supervision of the national socialist gestapo.

National socialist anti-Semitism does not aim only at the extinction of what the national socialists regard as an inferior race; it serves, above all, as a most important means in the effort to undermine democracy and the will to resistance by propaganda in those countries which national socialist Germany wishes to bring under its influence or control. One of the favourite weapons of national socialist strategy was the use of the slogan that the wars in Europe and even in Asia were not due to fascist aggression but to "Jewish warmongers" who drove the nations against their will to resist the peaceful and beneficial intentions of the fascist nations. The Jewish refugee problem, created by national socialism, served also the purpose (from the German point of view) of arousing attention everywhere to the existence of a "Jewish problem," and thus to intensify it, to increase generally the mental confusion and to aggravate and exploit economic antagonisms. The agitation against "Jewish bolshevism," the identification of Judaism with communism or Marxism, came to an end in Aug. 1939, with the conclusion of the treaty of friendship between national socialist Germany and the soviet union, although isolated anti-Semitic groups, especially in the United States, continued to make use of the slogan discarded (at least for the time being) by national socialist Germany, and in 1940 even by fascist Italy. The identification of Jews with communists was replaced in national socialist propaganda by that of Jews and capitalists. National socialism was now proclaimed as a revolution against Jewish capitalism, represented by the democracies or by any other country which seemed to stand in the way of national socialist aspirations towards world control.

While the Jews in Germany were entirely separated, economically, culturally, socially and politically, from the life of the German people, and while the Jews in Poland were subjected to even

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worse treatment, and forced in Warsaw and other cities to live within ghetto walls, the measures taken against the Jews under national socialist influence in other European countries met with the tacit resistance and sometimes with demonstrative acts of disapproval on the part of the non-Jewish population. The treatment meted out to the Poles by their national socialist conquerors had clearly shown that the anti-Jewish legislation served only as an entering wedge for a similar treatment of other non-Germanic races, once they were put into a helpless position like that of the Jews.

While there was no important new anti-Semitic legislation in Germany and Italy during 1940, the dispossession of Jews from all economic positions proceeded rapidly there as well as in Slovakia and Hungary, countries directly under the control of Germany and Italy. The political events in Rumania, which in a similar way destroyed the independence of the country and put it completely under national socialist control, had ruinous effects on the already precarious position of the Jewish communities in that country. In the Low Countries and in Norway the attempts at the *Gleichschaltung* of their economic and intellectual life resulted necessarily in a great increase of anti-Semitic propaganda, officially sponsored, and in restrictive anti-Semitic measures. Bulgaria and Yugoslavia, which had never before known any official anti-Semitism, adopted in the fall of 1940 the first legislative curbs upon the activities and political rights of their Jewish citizens. The Bulgarian legislation went especially far, while Yugoslavia up to 1940 has limited anti-Semitism to the introduction of a *numerus clausus* in universities and secondary schools. Of special importance was the introduction of the first racial legislation in France, where the government of Marshal Pétain on Oct. 18 excluded Jews from all higher offices of state, from the civil service, from the army and from all teaching positions. Although the free professions still remained open to Jews, regulations were promised to fix a determined proportion for them. All Jews were strictly excluded from any position in journalism, in the film business, in the theatre and in radio. On Oct. 8 the law of Oct. 24, 1870 was repealed, which had accorded to the Jews in Algeria full French civil rights. In the occupied area of France the Jews were subject to restrictions like those in Germany, while from Alsace-Lorraine, part of which was annexed by Germany, all Jews and all traces of former Jewish life were eliminated.

In the remaining democratic countries the danger to democracy, implied in fascist aggression and propaganda, has aroused a strong will of resistance and a new emphasis on the values of democracy and its faith in individual rights and in the equality of all citizens. The necessity of stressing national unity and of combatting all disintegrating influences was seen clearly from the lessons of the fall of France and other European democracies. Although anti-Semitic propaganda in the United States, and also in Great Britain, by no means ceased and sometimes combined with the propaganda for a policy of appeasement and of yielding to fascist claims, nevertheless the general temper of the public and the increased attention paid to "fifth-column" activities counteracted to a certain degree the growth of anti-Semitism in the democratic countries. (*See* also FASCISM; JEWS, DISTRIBUTION OF; JEWISH RELIGIOUS LIFE; REFUGEES.)

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Anti-Trust Law: *see* LAW (CASE).

Antonescu, Ion (1882–), Rumanian soldier and statesman, was born in Transylvania June 2 and fought with the Rumanian armies during the World War of 1914–18, after which he was promoted to the rank of colonel. He later became military attaché of Rumania in London and Rome, chief of the army's general staff and war minister. In 1938 he took part in an attempted coup d'état against Carol's regime. In July 1940 he was imprisoned for opposing too vehemently the cession of Bessarabia and northern Bukovina to the U.S.S.R.

Released from prison Sept. 2, 1940, Antonescu was named prime minister by King Carol three days later, in the midst of the disorders that followed the partition of Rumania. Antonescu's first act was to demand the abdication of Carol (Sept. 6). The prime minister then assumed dictatorial powers and on Sept. 14 formally promulgated a totalitarian rule. In collaboration with Horia Sima, leader of the Iron Guards, Antonescu proceeded to restore temporary quiet in his country and established working relationships with the axis by signing the German-dictated pact of Nov. 23. His attempts to pacify Rumania were rudely broken by the mass executions of former officials under Carol on Nov. 27 and the following days. Antonescu's government disavowed responsibility for these murders and his authority apparently was about to collapse. But thereafter he gained power steadily and successfully suppressed an incipient civil war (*see* RUMANIA). By Dec. 6, when he issued a decree ordering the penalty of death for military insubordination, he apparently had regained power.

Appeasement Policy: *see* COMMUNISM; FRANCE; ITALY; GREAT BRITAIN.

Apples. The commercial apple crop in the U.S. in 1940 was estimated Nov. 1 by the department of agriculture as 115,456,000bu. The 1939 crop was 143,085,000bu.; the five-year (1934–38) average, 121,755,000bu. The commercial crop includes both apples sold for processing and for fresh consumption. Production in the western states increased, being 43,562,000bu. in 1940 compared to 41,940,000bu. in 1939, while in the eastern apple-growing states it was 51,757,000bu. in 1940 and 69,506,000 bu. in 1939.

The Canadian apple crop was much smaller in 1940 in all the provinces, except British Columbia, than in 1939. The total crop in 1940 was 3,857,000bbl. compared to 5,792,000bbl. in 1939, a barrel being equivalent to three bushels or boxes. Despite the short crop the Canadian government adopted relief measures for growers, owing to the closing of export markets to the United Kingdom and other European countries. The government offered to apply a maximum of $1,662,500 to the purchase of apples, principally in British Columbia where a normal crop resulted in an unmarketable surplus.

Apple Production, United States and Canada, 1940 and 1939

	1940 bu.	1939 bu.
UNITED STATES		
Eastern		
New York	12,936,000	24,650,000
Virginia	10,325,000	10,800,000
Pennsylvania	9,100,000	10,998,000
West Virginia	4,868,000	5,670,000
New Jersey	3,354,000	4,252,000
Massachusetts	2,174,000	2,829,000
Maryland	2,077,000	2,362,000
Delaware	1,909,000	1,686,000
Connecticut	1,210,000	1,365,000
North Carolina	962,000	1,120,000
New Hampshire	925,000	1,214,000
Maine	752,000	1,068,000
Georgia	485,000	437,000
Vermont	413,000	780,000
Rhode Island	267,000	275,000
Central		
Michigan	5,967,000	10,501,000
Ohio	5,074,000	8,756,000
Illinois	1,876,000	4,107,000
Missouri	1,616,000	2,104,000
Kansas	1,296,000	1,074,000
Indiana	1,225,000	2,075,000
Arkansas	765,000	648,000
Wisconsin	595,000	684,000
Iowa	559,000	374,000
Kentucky	358,000	426,000
Nebraska	326,000	318,000
Minnesota	314,000	344,000
Tennessee	166,000	228,000
Western		
Washington	28,804,000	26,000,000
California	6,608,000	8,024,000
Oregon	3,160,000	2,900,000
Idaho	2,160,000	2,574,000
Colorado	1,564,000	1,058,000
New Mexico	700,000	603,000
Utah	330,000	395,000
Montana	236,000	386,000

CANADA	1940 barrels	1939 barrels
British Columbia	2,033,000	2,069,000
Nova Scotia	913,000	2,300,000
Ontario	636,000	1,011,000
Quebec	230,000	337,000
New Brunswick	45,000	75,000

(S. O. R.)

Applied Chemistry: *see* CHEMISTRY, APPLIED.
Applied Psychology: *see* PSYCHOLOGY, APPLIED.
Appropriations and Expenditures: *see* BUDGETS, NATIONAL.

Aquariums. In a war-torn world, difficulties of public institutions such as public aquaria become manifold. Even information as to the fate of such establishments near the centre of bellicose activities becomes difficult to obtain. It is known, however, that Regent's park aquarium in London was closed before the beginning of hostilities. The Berlin aquarium was apparently still in operation in 1940. American aquaria, although not completely cut off from the supply of eastern specimens, experienced difficulty in obtaining such material. These difficulties, involving shipping and the free movements of collectors, were increasing in 1940 and will surely result in the gradual reduction of exhibits from distant points. It has been reported that a number of private collections have already been impounded in various out-of-the-way places. No new aquaria announced openings during the year. (C. M. BR.)

Aqueducts. The All-American canal, the largest irrigation ditch in the United States, built by the bureau of reclamation at an estimated cost of $38,500,000 was ready for service in Sept. 1940. It will carry water diverted from the Colorado river by Imperial dam for a distance of 80mi. into Imperial valley, and with its 130-mi. Coachella Branch canal, water will be supplied for 1,000,000ac. of land in southern California. The Colorado river aqueduct, completed by the Metropolitan Water district of southern California in 1939 at a cost of approximately $200,000,000, extends 242mi. from Parker dam on the Colorado river to Cajalco reservoir, 12 mi. south of Riverside, Calif. This aqueduct will deliver 1,000,000,000gal. of water per day to Los Angeles and 12 neighbouring coastal cities. With the last of the tunnels on the distribution system under construction in Hollywood hills, the entire system, totalling 392mi., including 108mi. of tunnels, was nearing completion. The Delaware river aqueduct, an 85-mi. pressure tunnel, being built in 1940 by the board of water supply of New York, is an important feature of the $298,000,000 Delaware project which will add 500,000,000gal. to New York city's water supply, thus increasing the supply 50%. Scheduled for completion in 1945, the aqueduct, which is being driven from 25 shafts, will carry water 300 to 1,000ft. underground from the watersheds of the Catskill mountains to Hillview reservoir, located on the northern boundary of New York city. More than half the aqueduct has been excavated and concrete lining operations have begun. Eighteen miles of the new pressure aqueduct of the Boston Metropolitan District Water Supply commission, extending from Southboro to Weston, were opened in Oct. 1940 to safeguard and improve Boston's water supply. A 7-mi. pressure tunnel is nearing completion to give Baltimore a long-needed supplementary conduit to its source of supply. A 30-mi. aqueduct, consisting of a 46-in. steel and concrete pipe line, was being undertaken by Grand Rapids, Mich., as a part of its $4,100,000 Lake Michigan water supply project to bring water to the city from Lake Michigan. On the Central Valley project in California an initial 20-mi. section of the 46-mi. Contra Costa canal was completed to deliver water to the city of Pittsburg, Calif., for domestic use in Aug. 1940, and work was begun on an 8½-mi. section of the 40-mi. Madera canal to carry water from Friant dam to irrigate lands near Madera, Calif. Under construction were two tunnels of a 40-mi. aqueduct which will carry stored water from Deer Creek reservoir in Provo canyon over mountain slopes to Salt Lake City, Utah. (*See* also DAMS.)

(J. C. PA.)

Arabia. Total area (est.) 1,000,000 sq.mi. Total pop. (est., 1937) 9,300,000; Saudi Arabia, 4,500,000; Yemen 3,500,000; Oman and Muscat 500,000; Kuwait 80,000; Trucial Sheikhs 80,000. Language: Arabic; religion: Mohammedan. Rulers: Saudi Arabia, King Ibn Sa'ud; Yemen, Imam Yahaya Muhammad Hamid ed Din; Oman and Muscat, Sultan Sayyid Said bin Taimur; Kuwait, Sheikh Ahmed Ibn Jabir al Subah.

History.—With admirable self-control, Arabia continued during 1940 to steer clear of the war. It is true that the sympathies of nearly all Arabs were with Britain and those fighting on her side, but to the policy of neutrality laid down at the beginning of hostilities the states of Saudi Arabia and of the Yemen officially remained faithful. Around the coasts, on the other hand, in the Aden protectorate, in Muscat and Oman, along the Trucial coast and in Bahrein and Kuwait the various potentates showed the most lively concern for the welfare of British arms and did what they could to assist their great ally.

To outward appearances the war made little difference to Arabia. Inevitably, hostilities affected the numbers of pilgrims journeying to Mecca and Medina—this "tourist traffic" was called, before the discovery of oil in Hasa, Arabia's "only crop"—but otherwise life went on with the same bare margin of existence as has characterized the peninsula for centuries. Exploitation and exploration for oil in eastern Saudi Arabia continued, as did the search for gold in the western side of that state.

For some months, both Berlin and Rome tried to persuade the world that Ibn Sa'ud was but waiting the moment to pounce upon and attack Aqaba, at the head of the Red sea, and to march on Trans-Jordan and Palestine. He was said to be maintaining, for this purpose, a great army just inside the Hejaz and near where his own land, Trans-Jordan and Palestine meet. This tale was but a canard. Ibn Sa'ud's relations with Great Britain remained excellent and the best known Arab king of modern times refused to allow within his vast domain any intrigues against his oldest friends, the British.

Another story which the axis spread around the world was that the British were bombing the Hadhramis—those Arabs in the eastern section of the Aden protectorate who can claim to be the originators of the "sky-scrapers." In this yarn again there was not a word of truth, but it gained such currency that the sultan of Mukalla himself who, as he said, knows every corner of the Hadhramaut and would surely have heard of bombing had there been any, in October issued to the world a categorical denial.

In Oct. 1940, during the fasting month of Ramadhan, the Italians bombed American oil properties both in Saudi Arabia and in Bahrein, on the baseless assumption, presumably, that these oil fields were virtually British. These raids caused tremendous indignation throughout Arabia, which at the end of the year was anxiously awaiting further disclosures of axis intentions toward Islamic lands. (K. WI.)

Arbitration, International: *see* PERMANENT COURT OF INTERNATIONAL JUSTICE.

Archaeology. Western Hemisphere.—During the year 1940 two outstanding publications (see *Bibliography*) have summarized the archaeological cultures and synthesized the problems in North, Central and South America. Both embody the most recent archaeological conclusions and indicate the relationship of the four anthropological disciplines in solving the problems of aboriginal man in the new world.

Archaeological problems in the western hemisphere may be divided into two broad categories:

1. The antiquity of man and native culture in America. Association of man-made objects with now-extinct animals represents the

earliest horizon. Even though these extinct mammalian forms are regarded as belonging to the Pleistocene period, a considerable difference of opinion exists as to how many years ago man, responsible for the making of the Folsom points—and perhaps also responsible for the extinction of some of the Pleistocene fauna—roamed the western plains of the United States. The most conservative estimate would be from 8,000 to 10,000 years ago.

2. The time limitation imposed on the more sedentary and consecutive archaeological manifestations. Correlated ceramic sequences in the United States, Mexico, Central and South America, would seem to indicate that all of these cultural developments have taken place since the beginning of the Christian era.

Throughout 1940 archaeological excavations were made in practically every state within the union and Alaska. Work in Canada was discontinued because of the war in Europe. Excavations sponsored by the Smithsonian institution were continued at the famous Lindenmeier site in northern Colorado, where stratified deposits revealed two distinct cultural levels subsequent to the association of Folsom projectile points and extinct Pleistocene mammals. Sandia cave, near Albuquerque, N.M., contained two distinct strata of extinct animal bones and man-made flint points. The University of Michigan continued field researches on post-glacial beaches along the Great Lakes. The above sites have contributed the most authentic evidence of early man in the new world.

At a site 100mi. north of the Arctic circle, on a gravel spit in the Arctic ocean, an expedition sponsored by the American Museum of Natural History and the University of Alaska uncovered the remains of a prehistoric town of 625 square houses arranged in five main avenues. The excavations revealed a culture dependent on the hunting of walrus, seals, caribou and sea birds. Laboratory analysis of the material culture may reveal an early group of people unrelated to the modern Eskimo. Through a small grant from the Smithsonian institution several desiccated bodies were recovered from Pennock and Dall islands in southeastern Alaska.

The Washington State museum and the University of Washington continued an archaeological survey along the Columbia river basin. The University of Oregon completed important excavations in southeastern Oregon. Several archaeological sites were excavated in California by the University of California, the Southwest museum and the Los Angeles museum.

In the southwest a few of the archaeological programs were resumed on proto-historic sites in the Papago country by the University of Arizona and the Museum of Northern Arizona; the University of New Mexico on small house ruins in Chaco canyon, N.M.; the University of Utah museum continued excavation of cave sites; and the University of Colorado museum on important cave sites in Yampa canyon in northwestern Colorado.

The University of Texas carried forward WPA excavations in north-central Texas. Several sites in Oklahoma were dug under the sponsorship of the state university. An important survey was made in the counties adjoining the Mississippi river in Arkansas. The U.S. National museum resumed its archaeological program in Kansas. Other excavations, assisted by WPA funds, were made in Nebraska, Missouri, Iowa and Minnesota.

The University of Chicago and the Illinois State museum directed explorations in several important sites in Illinois. The Indiana Historical society concentrated its archaeological efforts upon the excavation of the important Angel mounds and village site in southwestern Indiana. The Ohio State museum sponsored a re-examination of the well known Ft. Ancient state park area in southern Ohio.

Several sites were excavated in Kentucky under the direction of the University of Kentucky and with assistance from WPA funds. Three important sites in Louisiana contributed additional data concerning the Marksville complex, which is distantly related to a highly developed prehistoric manifestation in Ohio and other northern Mississippi valley states, known as the Hopewellian phase.

The national park service sponsored an archaeological reconnaissance along the proposed Natchez Trace parkway in Mississippi. A large palisaded village was recovered around the Lamar site within the Ocmulgee national monument in central Georgia. Numerous sites were excavated in Alabama, Tennessee, Georgia, and North Carolina, as a result of continued federal sponsorship within the WPA.

Yale Peabody museum excavated a shell heap in Black Hill, Old Lyme, Conn. Vassar college inaugurated a five-year archaeological survey of the Hudson valley as one of the activities in the newly established division of anthropology. The Rochester Museum of Arts and Sciences continued its archaeological program in western New York by an excavation of an intensively occupied village site on Frontenac island in Cayuga lake. Numerous specimens recovered indicate another component of the Laurentian period. Two large ossuaries were excavated in Virginia by the U.S. National museum.

The second season's work of an expedition jointly sponsored by the Smithsonian institution-National Geographic society to Veracruz, Mexico, revealed additional examples of well carved colossal stone heads, carved altars, dated stelae, several caches of pottery figurines and painted pottery vessels. One of the stelae from Cerro de Mesa contains an early initial series date in the Maya calendar. This little known area in east central Mexico had produced an unusual amount of very important material. Near the close of 1940 the Smithsonian institution sponsored the exploration of prehistoric caves in Coahuila, northern Mexico, to determine their relationship with the cave-dwellers of the Big Bend area in southwestern Texas. The Departamento de Monumentos of the Mexican government and other institutions continued archaeological investigations, repairs and restorations in several of the well known sites, such as Monte Alban, Chichen-Itza, Cholula and Uxmal, Mexico.

The Carnegie institution of Washington, which continued archaeological investigations, locating new sites, directing reconstruction and repair contributed much to prehistory in Yucatan, northern Honduras and Guatemala. An archaeological survey sponsored by the American Philosophical society carried forward explorations of the Alta Verapaz in Guatemala.

In the Cocle province of Panama an expedition from the University of Pennsylvania excavated 30 graves and caches containing multiple burials and hundreds of pottery vessels, semi-precious stones, a large quantity of gold ornaments of exquisite workmanship, indicating the vast amount of non-perishable objects placed with the bodies at the time of burial.

In South America very few archaeological expeditions were inaugurated, although surveys were made looking toward the selection of sites for future excavations. Some of the institutions in Peru, Bolivia and Argentina continued work in their respective states.

The usual annual meetings of the American Anthropological association and the Society for American Archeology produced summaries of archaeological investigations. In addition, numerous archaeological conferences were held throughout the United States and Mexico. In May 1940 the Eighth American Scientific congress was held in Washington, D.C., at which time numerous archaeological papers were read by the delegates from the Pan-American countries.

Bibliography.—Besides the many technical reports published during the

year (vol. 42, *American Anthropologist* and vol. 6, *American Antiquity*), the two outstanding publications for 1940 are: *Essays in Historical Anthropology of North America,* published in honour of Dr. John R. Swanton by the Smithsonian institution as vol. 100 in the Smithsonian Miscellaneous Collections; and *The Maya and Their Neighbors,* dedicated to Prof. Alfred M. Tozzer. Both books contain a series of articles by 14 and 34 authors respectively. (F. M. Se.)

Eastern Hemisphere.—Although the war virtually stopped archaeological activity in central and western Europe, as well as Africa, with the exception of Egypt, many important discoveries were made during 1940. In the following summary the earlier periods are treated as a whole; for the Neolithic and later periods the evidence is presented on a regional basis. A bibliography for those desiring further information is given at the conclusion of this article.

The Palaeolithic Period.—In the vicinity of Montignac, in the Dordogne region of south-central France, a cave—the Grotte de Lascoux—containing Altamira-like paintings of the Upper Palaeolithic period was discovered, according to information received from Professor H. Breuil. Polychrome-painted hunting scenes are depicted, including bison, horses, reindeer and rhinoceroses. The place was found by a 12-year-old boy, who had to crawl through an opening one foot in diameter to gain access to the chambers containing the paintings.

A dispatch from Rome announced the finding of an Upper Palaeolithic female figurine, or "Venus," at Chiozza, near Reggio Emilia. It is stated that the statuette is about eight inches long and made of limestone; the arms, feet and head had been broken off.

An expedition from the Marr Institute of Languages, History and Material Culture, Leningrad, excavated at Samkura cave, near Dzherulsk, in western Georgia, U.S.S.R., and found stone implements—knives, scrapers, points, etc.—of the Palaeolithic period, associated with bones of an extinct cave bear.

Fossil Man.—Rev. Joseph Doherty, S.J., of Boston college, who has been conducting excavations at the important Palaeolithic cave of Ksâr 'Akil, six miles north of Beirut in Syria, announced the discovery of the fossilized bones of a child 7 or 8 years old, found below 34 feet of Upper Pleistocene deposits. On the basis of the very meagre data available, it appeared that this individual represents more or less the same type known in Palestine at the Wadi Mugharet caves, near Haifa, and the cave of Jebel Kafseh, near Nazareth. In certain respects this type is fundamentally modern, but more primitive "neanderthaloid" features are also apparent.

Neolithic and Later: The Near East.—In northeastern Syria the Theodore Marriner Memorial expedition, under the joint auspices of the Museum of Fine Arts, Boston, and the Oriental institute of the University of Chicago, Dr. C. W. McEwan, field director, excavated at Tell Fakhariyah, near Ras el-'Ain, in the spring and summer of 1940. The objective was a Mitannian administrative city of *c.* 1500 B.C. Brief reports from the field indicated the discovery of a palace with a treasure of ivories, statuettes and other objects of art.

Some of the most significant finds at Ras Shamra, the ancient city of Ugarit, were reported by Professor Claude Schaeffer, director of the French Archaeological expedition to Syria. In the vaults of one of the houses in the 11th level (19th to 17th centuries B.C.), Aegean-type pottery, probably Cretan, as well as stone and alabaster vases of Egyptian origin were found, attesting widespread international commerce at an early period in the eastern Mediterranean. Probably to be attributed to the Hurrians are two gilded copper cult statuettes of the early second millennium B.C., which reveal an art hitherto totally unknown in north Syria. Of Mitannian origin is an ornamented battle-axe of the 15th to 14th centuries B.C. According to Professor Schaeffer, the metal of the blade "has been tempered and hardened, thus revealing the beginnings of steel-making." The blade has been joined to the elaborately decorated head of the axe by shrinking, a feature requiring a high technical skill and obviating the use of rivets.

THE ARCHAEOLOGICAL "FIND" of 1940 was the tomb of Pharaoh Psusennes, discovered in February by Prof. Pierre Montet on the site of ancient Tanis, Egypt. Montet is shown examining the silver sarcophagus after its lid had been removed

The results of the 1940 excavations at Tell el-Kheleifeh, the ancient city of Ezion-Geber, on the Gulf of Aqabah, confirmed Professor Nelson Glueck's previous reports that the centre of this important site was the smelter-refinery. Digging, under the auspices of the American School of Oriental Research in Jerusalem and the Smithsonian institution in Washington, uncovered extensive smelters and foundries, as well as fortifications, of the 10th and 9th centuries B.C.—the most important phase being contemporary with the reign of Solomon.

Egypt.—At the necropolis of Sakkara, burial ground of Memphis, the ancient capital of United Egypt, Zaki Y. Sa'ad of the Egyptian department of antiquities discovered three important Old Kingdom mastaba tombs. One of these produced a beautifully inscribed false wooden door; the second bore the name and titles of Queen Nebet, wife of King Unas, the last king of Dynasty V (*c.* 2860–2830 B.C.); while the third contained the remains of the "Vizier" Mehou, grandson of Unas.

The tomb reliefs show that this man was a rich landowner, and among them an entirely new subject—the tortoise—appears for the first time in Old Kingdom art. The composition of this unique scene includes birds and fishes peering at the tortoise, which seems to be standing on its head.

Early in 1940 the find of the year and the most significant archaeological discovery in the Egyptian field since Tutenkhamon's tomb, opened in 1922, was made at Tanis, ancient capital of the Tanite kingdom of Lower Egypt, by Professor Pierre Montet of Strasbourg university. This consisted of the intact tomb of Pharaoh Psusennes of Dynasty XXI (*c.* 1054–1009 B.C.), who reigned some 200 years after Tutenkhamon, and who is believed to have been the father-in-law of Solomon. The carved sarcophagus of black granite contained a mummy case of solid silver—unquestionably one of the most beautiful objects discovered anywhere in recent years. In addition to elaborate decoration, the silver effigy bears the royal insignia, while alongside it four canopic jars were found. Within was a silver-gilt body covering and a gold mask, together with a mass of fine jewellery, many solid gold jars and vases, as well as the arms of Egyptian soldiery at the time of Solomon.

Cyprus.—At Khirokitia, near milestone 30 on the Nicosia-Limassol road, Dr. P. Dikaios, curator of the Cyprus museum, discovered a brilliant Neolithic culture with an early non-pottery

UNDISTURBED early Chinese tomb dating from the Han period (the two centuries before and after Christ), found on the Lach-truong plain in Thanh-hoa province, Northern Annam, Indo-China. The tombs of this period have vaulted roofs of massive brickwork and contain elaborate funerary furniture

stage, which is dated by the excavator at about 4000–3500 B.C. In one of the houses a large number of infantile skeletons were unearthed, in direct association with the clay head of a Chthonic (earth) deity and adult burials. Dr. Dikaios regards this as evidence of infant sacrifice connected with the death of adult people buried in the house and with the worship of the Chthonic deity.

Miss J. du P. Taylor, assistant curator of the Cyprus museum, excavated a Bronze Age miners' village at Apliki, near Lefka, in central Cyprus. Although from early times Cyprus supplied the Mediterranean with copper, as attested by the fact that the island derives its Greek name Kupros from the metal copper, it has hitherto been impossible to distinguish the later Roman workings from those of the earlier period.

The contents of a Cypriote tomb found at Lapithos, on the north coast of Cyprus, were published by Miss V. R. Grace of the American School of Classical Studies at Athens. In addition to material of the Early Bronze Age in Cyprus (Gjerstad's Early Cypriote III Period), this tomb produced a Minoan vase, "the earliest recorded import into Cyprus and certainly the earliest known instance of Cretan ware in the Levant." This find, which is referable to Middle Minoan Ia in Crete, indicates that the Early Bronze Age in Cyprus did not begin before the Middle Bronze Age in Crete: *c.* 1900 B.C. in terms of Minoan chronology.

Crete.—On a ridge about two miles along the ancient road linking Knossos and its port Amnisos, R. W. Hutchinson, curator of Knossos, excavated a Late Minoan I *tholos*-tomb of *c.* 1580–1550 B.C. for the British school at Athens. On the south jamb of the doorway into the burial chamber, which contained three pit-graves, a Minoan inscription consisting of a double axe and trident sign was found. According to Mr. Hutchinson, this newly-discovered *tholos* is significant in that it suggests a link between the circular tombs of the Massara plain in central Crete and the famous "beehive" tombs on the Greek mainland, erected some two centuries later, after the fall of Knossos.

Italy.—The field of Etruscan archaeology received an important contribution during 1940 from the authoritative pen of Dr. G. M. A. Hanfmann of Harvard university. This comprehensive treatise, "The Etruscans and Their Art" (*Bull.* Rhode Island Museum of Art, xxviii [1940] 1–35), covers the entire development of Etruscan art and culture from its beginnings (850 B.C.?) down to 80 B.C., when Etruscan independence was virtually surrendered to Rome.

The excavations at Ostia, directed by Guido Calza, continued to yield significant results. Many interesting sculptures, as well as an important early Christian basilica, were unearthed during 1940 at the site of this extensive commercial and administrative Roman city.

At Herculaneum, Amadeo Maiuri discovered a small Christian chapel in an upper-story room of one of the houses of that city. This evidence raises anew the question of the actual presence of Christians in the buried cities of Campania.

In clearing a new area on the southwest fringe of the city of Pompeii, Commendatore Maiuri found a most striking marble portrait head, identified as Marcellus, the nephew of Augustus.

U.S.S.R.—Excavations under the direction of G. Gurina of the Marr Institute of Languages, History and Material Culture, Leningrad, in the district of Povenets on Lake Onega (Karelian—Finnish S.S.R.), revealed a rich Bronze Age site on the Orov-Navolok peninsula. In addition to a bronze foundry, many bronze articles and some interesting pottery were found.

On the right bank of the Don river, five miles below the Cossack settlement at Tsymlianskaia, I. I. Liapushkin, leader of the Sarkel expedition of the Institute for the History of Material Culture, excavated a highly fortified *gorodishche* of the 8th to 10th centuries A.D. The three building levels yielded a sequence of pottery vessels, iron objects and personal ornaments showing connections between this site and the steppes on the one hand, and the Black sea littoral, the cities of the sea of Azov and the Caspian sea on the other.

In central Asia, A. N. Bernstam investigated a series of tumuli at Kenkol near the headwaters of the Talus river, Kirghiz S.S.R. Below seven of these burial mounds, which belong to the 1st century A.D., catacombs were discovered, cut out of the loess and containing burials associated with grave furniture, in some cases similar to modern Kirghiz objects. In the southern part of the Farghāna valley, Uzbek S.S.R., an expedition led by M. E. Masson engaged in an important reconnaissance project. A series of interesting archaeological finds was made in this area during the construction of a large irrigation canal.

Iran.—The third season's work of the Iranian expedition of the Metropolitan Museum of Art at Nishapur, in northeastern Iran, produced the first early Islamic paintings ever found in this region. These consist of both polychrome and black-and-white wall paintings, showing figural and ornamental subjects; they date from the latter part of the 8th and the early 9th centuries of our era. Following the downfall of the Sassanian empire, Nishapur was an important trade centre, as suggested by finds of imported celadon and stoneware of the T'ang dynasty (617–906 A.D.) from China, as well as by fragments of polychrome lustre-ware of Samara type from the Tigris valley to the west. The site also yielded many interesting bronzes and ceramics of the Islamic period.

Excavations by R. Ghirshman, director of the archaeological expedition of the Louvre museum, were conducted at Shapur, a city at the entrance of a gorge on the edge of the Iranian plateau. This was the site of a royal residence built by Shapur I, second king of the Sassanian dynasty (225–636 A.D.). Monumental bas-reliefs, the king's palace with mosaic panels, a Zoroastrian temple, and elaborate statuary were among the discoveries. The city, laid out on Hellenistic pattern, is important in that it gives information concerning the beginnings of Sassanian art and culture in the middle of the 3rd century A.D.

Afghanistan.—The site of Begram, 45 miles north of Kabul, was digged by M. Joseph Hackin, leader of the French Archaeological mission to Afghanistan. Begram was the capital of ancient Kapisi and belongs to the Hellenic period (1st to 2nd centuries A.D.) of this region. The elaborate Hellenistic plaques, Graeco-Roman bronzes and coins, Indian ivories, Chinese lacquer (Han period), and utensils of domestic use, suggest that one of the fundamental sources of inspiration of Graeco-Buddhist art came from Afghanistan.

India.—Some three and a half miles east of Bhera in the Jhelum valley, Punjab province, C. L. Fabri discovered a stratified site of the times of the Great Moguls, at a place called Divanpura. One of the mounds, known as Surkhanvali Ahli, yielded over 1,800 objects, which range in age from the 15th century to 1750 A.D. Thus for the first time the story of the daily life in a provincial Mogul city has been revealed in all its details.

Indo-China.—Since 1934 Professor Olov Janse has been conducting important archaeological researches in Indo-China, the chief aim of which has been to study the southern sphere of Chinese civilization from the Han period to the beginning of the Ming dynasty. The expedition, originally on behalf of the Paris museums (Guimet and Cernuschi) and the French school of the far east, has been under the auspices of the Harvard-Yenching institute since Nov. 1938. As the actual field-work was not terminated until June 1940, it seems appropriate to summarize here for the first time some of the main results of Professor Janse's excavations.

At Dong-Son in Thanh-hoa, northern Annam, a site extending for several miles along the right bank of the Song-Ma river, an interesting native culture was discovered. This was autochthonous in its early stages, and evidence for the use of pile-dwellings was found. But as a result of contact with southward spreading Chinese civilization, first appearing in this area during Han times, the upper levels contain many exotic objects and the local material becomes greatly modified. In addition to large amounts of pottery, various ornaments, drums, vases and basins of bronze, iron weapons, as well as jade rings and beads of rock crystal and gold, attest the really high development of the Dong-Son culture. In the nearby tombs the evolution of Dongsonian craftsmanship from the beginning of Han (202 B.C.) to the time of the T'ang dynasty (617–906 A.D.) can be traced. Some of these tombs were very rich, but with the exception of the funerary furniture nothing remained to indicate the position of the

burials. Investigations at the necropolis of Sa-huynh, Annam, revealed a culture in some respects similar to Dong-Son and probably to be assigned to the beginning of our era.

Professor Janse also excavated about 100 Chinese tombs in Tonkin and northern Annam, establishing the evolution of Chinese tomb-construction from the 2nd century B.C. down to the 13th century A.D. The oldest and most elaborate vaults with up to three chambers belong to Han times; the later ones become gradually smaller until during the T'ang period they are generally no longer vaulted. With the beginning of the Sung dynasty (906–1273 A.D.) the custom of making brick tombs went out of use, and the coffins were placed directly in the ground. Magnificent funerary furniture was discovered at these sites, especially at those of the Han period. In the actual construction of the vault, glazed polychrome bricks were sometimes used, while in other cases the bricks were decorated in linear relief depicting dancing scenes, geometrical motifs, etc. This latter type may or may not be glazed. Large quantities of ceramics, small-scale reproductions of peasant's houses, glazed earthenware vessels, as well as many fine bronzes, including a lampstand in human form and believed to represent the solar tree symbol, were found in the tombs. One of the most interesting characteristics of the southern sphere of Chinese civilization is the fact that in certain respects it had connections with the west.

Of no less significance than his discoveries at Dong-Son and in the Chinese tombs of Tonkin and Annam is a series of Chinese pottery kilns, found by Professor Janse at Tam-tho, in the Thanh-hoa province, northern Annam. On the basis of the study of literally tons of pottery associated with some 12 elliptical kilns, many of which go back to the early Han (202 B.C.–9 A.D.), important data bearing on the method of manufacture have been secured. Furthermore, it has been demonstrated that the wares made at Tam-tho were not only purveyed to the Chinese population but to the indigenous people as well, since identical examples were found at Dong-Son.

China.—Professor W. Perceval Yetts's book, *The Cull Chinese Bronzes,* which was published, will be welcomed by collectors and archaeologists alike. Almost every type of Chinese bronze object, beginning with material excavated at An-yang, the site of a Shang-Yin capital of the second millennium B.C., through Han times (202 B.C.–220 A.D.), is discussed and illustrated.

The rich coastal province of Fukien, hitherto practically unknown from an archaeological point of view, was investigated by Malcolm F. Farley of Fukien Christian university, Foochow. Many large kiln-sites of Han and later times, as well as a series of Han, T'ang and Sung tombs, found at Foochow, were reported; the material found not only ties in with Professor Janse's outstandingly brilliant work in Indo-China, but also with that of John Cox in Hunan province and Father Finn on Lamma island, off Hongkong. At Chaochowfu, Kwangtung province, Mr. Farley discovered an enormous kiln-site of Sung and Yüan dynasty period (960–1368 A.D.). The wares produced at these southern Chinese potteries were traded to Egypt, Mesopotamia, Syria and East Africa, and helped build the great international commerce for which China has long been famous.

Manchoukuo.—A number of mounded tombs on the T'ung-Kou plain, Chi-an district, were excavated by the education department of the Manchoukuo government under the direction of Dr. Kôsaku Hamada. Owing to Dr. Hamada's untimely death the work was finished by Dr. Hiroshi Ikéuchi and Dr. Sueji Umehara, and these two scholars have produced a magnificent volume covering the results. Many elaborate polychrome paintings, mostly on the plaster walls of the burial chambers, were found. On the basis of similar designs found on dated Chinese mirrors, as well as the lack of Buddhistic influence in the art, the tombs are considered to belong to the 5th century A.D.—the oldest to about 427 A.D., when the Kao-kou-lian capital was moved from T'ung-Kou to Heijô.

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Archery. An outstanding feature of the 60th annual tournament of the National Archery association, which was held at Amherst, Mass., Aug. 5–10, 1940, was the shooting of 18-year old Miss Ann Weber of Bloomfield, N.J., who not only won the ladies' championship, but, in doing so, established new records in the Single and Double National round (71–513 and 143–979), the Single and Double Columbia round (72–582 and 144–1,148), the Single and Double American round (90–666 and 180–1,302), and in the team shoot (96–718), seven records in all. The men's championship was won by Russ Hoogerhyde of Northbrook, Ill., who set up new records of 90–726 and 180–1,428 in the Single and Double American rounds. Miss Mary C. Thompson of Phoenix, Ariz., won the girls' junior championship, and Fred Folberth of Cleveland, O., won the boys' junior championship.

The ladies' flight shoot was won by Miss Glendolene Vineyard, Canby, Ore., with a shot of 394·1 yards; and the men's flight shoot was won by Curtis L. Hill, Dayton, O., with a shot of 481·2 yards. There were 265 archers who took part in this event.

The National Field Archery association, which was organized in 1939, held a series of tournaments to establish the field archer champion of the United States. This honour was won by E. Hill Turnock of Wilkinsburg, Pa.

The 11th Annual Intercollegiate Telegraphic Archery tournament, sponsored by the National Archery association, was held in May 1940, and brought out an entry list of 158 teams (1,204 individual archers), representing 109 colleges. The winning team was Team I of Los Angeles City college, Los Angeles, Calif.

During Nov. 1940, the National Archery association sponsored an Interscholastic Mail Match between teams of six archers, each representing high schools and other preparatory schools. In this event, first places were taken by the girls' team representing Bloomfield high school, Bloomfield, N. J., and the boys' team representing Will Rogers high school, Tulsa, Okla. (L. C. S.)

Architects, American Institute of: *see* AMERICAN INSTITUTE OF ARCHITECTS.

Architecture. The year 1940 will be remembered for the wanton destruction of architecture by aerial bombardment. Aside from this the war upset the normal development of architecture by arresting civil building and by making peacetime theories of design invalid under aerial warfare. The invasion of France halted the artistic influence of that country on the world. No longer was it possible for artists of all nationalities to work in Paris, to study at the École des Beaux Arts; or for young architects from the United States to attend the American school at Fontainebleau, the American academy in Rome or to travel in Europe on architectural scholarships. Only the past and the activities of refugees continued to exert the European influence on the architecture of the Americas, Palestine or the European colonies.

While Europe's role in the development of architectural progress and influence was temporarily terminated, some progress in architecture continued in the United States for the larger part of the year. There, various schools of thought furthered the growth of the new architecture rising out of industrial and scientific advances as well as social changes. The new problems brought about by an ever-increasing use of the motor car affected towns and buildings; urban areas were broken up into a series of suburban centres; superhighways, large span bridges and vehicular tunnels were built. Street congestion crowded stationed automobiles off the public thoroughfares and in the planning of many buildings automobile parking provisions were incorporated in new ways. The opening of the landscape by more extensive highways and parkways and a greater concern for leisure-hour activities brought more parks and playgrounds, new bathhouses, park pavilions, and camps or hostels. Changes in industrial production and increasing wages in the building trades reduced the use of craftsmanship and increased the use of standardized prefabricated units. Before

the war curtailed civil building in the various countries the aim for social betterment led to the construction of housing, clinics, health centres and recreational projects. The economic pressure diminished luxury building and caused a simpler architectural expression. However, in the totalitarian countries building designs were elaborated in keeping with the pomp of propaganda. Governments continued to control a large volume of building and influenced the development of architecture by establishing examples of national styles or by hampering experimentation with forms of architectural expression.

It can be assumed that the year 1940 ended a period of important architectural development which extended between two wars. The first decade thereof gave birth to revolutionary architectural thought which resulted in the beginnings of functional architecture in France and Germany. The second decade saw the gradual spread of this new architecture to the other countries of the world. At the end of this period the new architecture had progressed in the democracies from abstract theories to concrete expressions influenced by varying regional differences, while in the totalitarian countries it had been replaced by national styles.

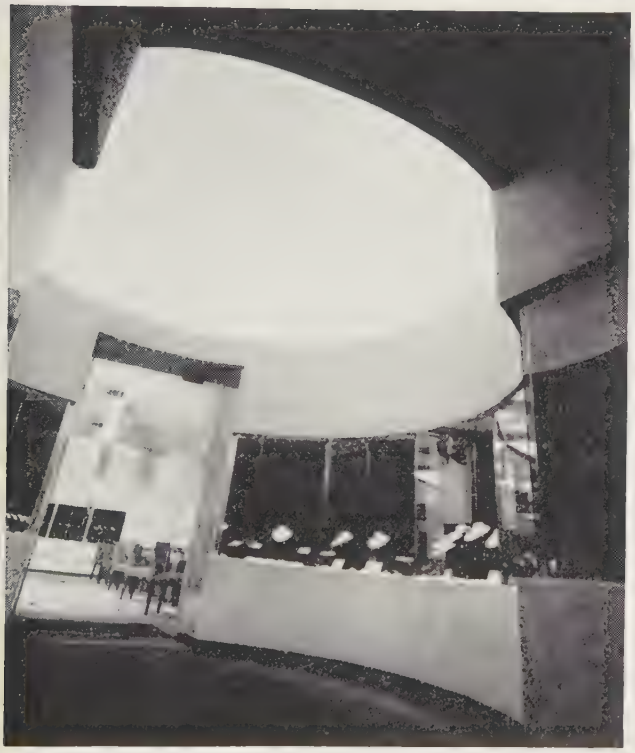
Modern Architecture.—Modern architecture was not so much concerned with a conscious effort to produce beauty as with a truthful interpretation of everyday life. The architectural examples of note were buildings devoted to shelter, to work, to the care of the sick, to social services, to recreation or to transportation. The changed appearance of the buildings was due to two causes. First, new styles were evolved to produce a superficial change on the façades and the interiors by the use of: new surface treatments with variations in ornamentation; curved walls sometimes inspired by streamlining; freakish motifs added for sensational effects. As none of these had any real functional justification in the plans they were only pseudomodern and became identified as a modernistic architecture. Second, the search for a reasoned expression of the technical, economic and social progress produced more revolutionary changes. This resulted in a new architecture which brought the functional, structural and aesthetic elements of the design into an organic unity and was thus known as functional or organic architecture. The year 1940 saw the general acceptance of the underlying doctrine of this architecture, leaving however its visual expression to further development. The forms which functional principles produced still varied with individual designs according to the allowances made for emotional reaction. The uncompromising scientific reasoning expressed in the writings of Le Corbusier (functional architecture) as well as the more emotional approach of Frank Lloyd Wright (organic architecture) found their following. The common premise to these variations was an avoidance of formulae or conventions in the effort to liberate the design of buildings from restraining influences. This resulted in the free or open plan which considered the interior ahead of the exterior and eliminated solid enclosures wherever possible; thus were created interpenetrating spaces devoted to different functions (*e.g.*, lounging, dining, reading) which were only separated from the outside spaces by sheets of glass. Symmetry had disappeared. Progress in the development of this architecture was indicated by greater concern for the varying local conditions of climate, available building materials and temperaments; it therefore became less international and more regional in character. The spread of modern architecture in the United States is best illustrated by the fact that in its *Guide to Modern Architecture, Northeast States* the Museum of Modern Art of New York lists the names of approximately 240 architects and designers. The periodical *Architectural Forum* devoted an issue to the substantial accomplishments of 1931–40 in relating machine-inspired design to a machine-inspired way of life.

Traditional Architecture.—Many causes remained for the perpetuation of traditional architecture. There existed a desire to recreate the past or to glorify a nationalistic ideal by using the decorative elements of richer historic periods. It was also found expedient to have established patterns or prototypes to draw on when large organizations or governments wished to set a style. Furthermore, the growing feeling of nationalism combined with the effort to unite behind one popular conception and the fear of foreign influences restrained the modern movement. The general public still failed to appreciate the intellectual reasoning behind the unfamiliar appearance of functional architecture. Also the business interests behind building capital feared that the stability of the property values might become upset by a too drastic architectural change or that the volume production of modern houses necessary for profit would not be reached until the new architecture became popular.

Materials and Methods.—It became more generally recognized that the prefabrication of entire houses was not practicable. Efforts were directed towards the standardization of units like doors, windows, etc., and the prefabrication of standardized sections like wall or floor panels. Scientific developments added some new materials. New plastics found decorative usages. Plywood continued to increase in importance as a universal material for structural and decorative purposes. Likewise glass underwent further developments to extend the possibilities of its use in buildings; for example, glass doors and furniture without steel or wood edges made their appearance.

Examples of Recent Architecture.—The war in Europe shifted the scene of architectural development to the United States. The designs of Frank Lloyd Wright, the pioneer of the modern movement in the U.S. were exhibited at the Museum of Modern Art in New York. In California the functional houses, international in character, by Richard Neutra commanded interest. Greater recognition of local conditions became evident in some small houses by the architects William W. Wurster, Harwell H. Harris and others. The eastern states likewise developed their own characteristics of modern architecture, which in 1939 were seen in a house on Mt. Desert island, Maine, by George M. Howe, in the following year in an exhibition house for *Collier's* magazine at Rockefeller Center, New York, by Edward D. Stone and also in several houses built by some of the younger architects. The New York World's Fair in its second year decided to show interiors of modern homes. New York's Metropolitan Museum of Art displayed modern house furnishings against modern architectural backgrounds. The controversy between modern and traditional architecture was illustrated by competing displays in an exhibition entitled "Versus," held at the Architectural league in New York. The premise that buildings are integral parts of communities and that architectural design does not stop with the walls of a building was shown in theory in the exhibition "Telesis" at the San Francisco Museum of Art and in practice in the parkways, parks, bathing beaches, bridges and tunnels executed in New York under the direction of Commissioner Robert Moses.

Parking provisions were incorporated on the roof of a store building for Sears, Roebuck and Co. at Los Angeles (John S. Redden, architect, and John G. Raben, designer). A church was proposed for Kansas City, Mo. (Frank Lloyd Wright, architect), with space for automobiles on several levels. The Lake County Tuberculosis sanatorium at Waukegan, Ill. (William A. Ganster, W. L. Pereira, architects), gave a clear expression to the functional requirements. Good modern architecture was likewise found in many industrial buildings, for example in the work of Albert Kahn, Inc., architects and engineers, or of the Austin company, engineers and builders. The defence program brought great activity in the construction of factories and housing for



Upper left: ST. PETER CLAVER MISSION, Montclair, N.J. Albert Hoffman, designer; George Kratina, sculptor; Vincent Pacelli, painter; Paul C. Reilly, architect

Upper right: THE LAKE COUNTY TUBERCULOSIS SANATORIUM, Waukegan, Ill.; William A. Ganster and offices of W. L. Pereira, associated architects

Above, left: INTERIOR OF JEWELLERY SHOP (Ciro of Bond Street), New York city; Morris Ketchum, Jr., architect

Right, centre: A "HOME OF ARCHITECTURE" on a mountain slope in Arizona was constructed in 1940 by Frank Lloyd Wright as the winter quarters for his students

Right: BERKSHIRE SYMPHONIC MÚSIC SHED at Tanglewood, Stockbridge, Mass.; Joseph Franz, engineer

troops and industrial workers.

In *England,* war construction practically excluded all other building and made air-raid precaution its primary concern. Efforts were directed towards camouflage, protection against damage from bombing and the provision of shelters. Prefabrication played a role in the rapidly erected evacuation camps for children. The building centre in London exhibited blacked-out protected shop fronts. Some buildings planned for social needs before the war were completed; nurses' homes, health clinics, a working-girls' club and sports pavilions. A modern design selected in an architectural competition for a town hall at Wembley (Clifford Strange, architect) was executed. Greater adherence to traditional character was shown in the Wiltshire county offices at Trowbridge (P. D. Hepworth, architect).

Italy found itself engaged in the preparation of a world's fair for 1942 in combination with ambitious plans for the beautification of Rome. Some buildings of the exposition were completed and a large amount of materials for the remainder was on hand at the beginning of the war. Traditional motifs inspired by the architecture of imperial Rome appeared in the embellishment of buildings, avenues and squares.

Germany also had its national style of which the Reichskanzlei in Berlin was one of the most grandiose and the last important example to be completed before the war. A building for the flag regiment of the air force best illustrated the expense and careful planning which typified German military preparations. Here trees and the natural landscape served as protection against aerial warfare.

Switzerland remained isolated from the regimentation of thought practised in the countries around it. For example, the Technical school at Berne (Hans Brechbühler, architect) expressed the principles of modern architecture brought out by Le Corbusier in using a skeleton block on stilts with a glass front for its architectural form.

Finland was the first country to begin a reconstruction program. Alvar Aalto, best known for his library at Viipuri, was appointed chief architect. In his prewar design for the Gullichsen residence at Norrmak, he used an unusual free plan with movable partitions. The town of Helsinki provided a large stadium with an imposing reinforced concrete tower (Yrjö Lindegren, architect) in preparation for the Olympic games which the war prevented.

Palestine continued to produce some interesting modern architecture. Eric Mendelsohn, a refugee from Germany who had also made a reputation in England, built the Hebrew university medical centre on Mt. Scopus outside Jerusalem.

The architecture of the British colonies also deserves consideration. An imposing office building in style not dissimilar from many in the United States was built for the Anglo-American corporation of South Africa (Sir John Burnet, Tait and Lorne, architects) at Johannesburg.

In Pretoria, many new buildings showed the spread of modern functional architecture.

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Arco, Georg Wilhelm Alexander Hans, COUNT VON (1869–1940), German radio engineer, was born in Grossgorschuetz Aug. 30. He served as an officer in a battalion of a guards regiment in Berlin for three years, leaving the army in 1903 to devote himself to scientific work. After studying in Berlin university and the technical high school at Charlottenburg, he was employed as an engineer by the General Electric company of Berlin. He was responsible for the establishment of the broadcasting station at Nauen and for the formation of the Telefunken Gesellschaft, of which he was the first chief engineer. Arco, known as the Marconi of Germany, died in Berlin on May 7.

Arctic Exploration: *see* EXPLORATION AND DISCOVERY.

Areas and Populations of the Countries of the World.

The table that follows gives the latest known figures of the area in square miles, the population in thousands and the population per square mile of the different countries of the world.

Name of State	*Area* (in Square Miles)	*Population* (000's omitted)	*Population per Square Mile*
Afghanistan	250,900	10,000	39.9
Albania	10,800	1,120	103.7
Andorra	191	5	26.2
Argentina	1,079,965	13,129	12.1
Australia, Commonwealth of	2,974,581	6,997	2.3
Belgian colonial empire	960,000	22,298	23.2
Belgium	11,775	8,396	712.2
Bohemia-Moravia (Protectorate) as of March 1939	18,914	6,794	359.2
Bolivia	419,470	3,398	8.1
Brazil	3,291,416	45,002	13.7
British colonial empire	4,012,396	71,433	17.8
Bulgaria	39,814	6,371	160.0
Burma	261,610	16,000	61.0
Canada	3,729,665	11,484	3.0
Chile	289,776	5,001	17.0
China, total	4,480,992	450,000	100.4
China Proper	2,903,475	422,708	145.6
Manchuria	460,383	36,949	80.2
Mongolia	625,783	2,078	3.3
Tibet	450,000	3,722	8.3
Colombia	448,794	8,724	19.2
Costa Rica	23,000	639	27.7
Cuba	44,144	4,200	95.1
Danzig (as of Dec. 31, 1937)	754	405	537.1
Denmark (exclusive of Greenland)	16,575	3,805	229.5
Dominican Republic	19,325	1,479	76.5
Ecuador (excl. of uninhabited territory)	175,630	2,757	9.9
Egypt (excl. of uninhabited territory)	383,000	16,030	41.9
Estonia	18,371	1,134	61.8
Finland	134,000	3,800	28.4
France	212,736	41,980	197.4
French colonial empire	4,657,000	70,147	15.1
Germany (as of March 1939)	226,196	78,953	349.0
Great Britain and Northern Ireland, United Kingdom of	93,991	47,680	507.2
Greece	50,147	7,150	141.6
Guatemala	48,290	3,284	68.0
Haiti	10,204	3,000	294.0
Honduras	46,332	1,000	21.6
Hungary (as of October 1938)	40,530	10,111	249.5
Iceland	39,709	120	3.0
India (exclusive of Burma)	1,547,069	362,000	234.0
Iran (Persia)	634,360	15,000	23.6
Iraq	116,000	5,000	43.1
Ireland	26,601	2,937	110.4
Italian colonial empire	1,367,174	14,072	10.3
Italy	119,764	44,394	370.6
Japan	148,756	72,223	485.5
Japanese empire	114,603	31,288	273.0
Latvia	25,016	1,994	79.6
Liberia	46,000	2,500	54.3
Liechtenstein	65	12	184.6
Lithuania (exclusive of Memel)	20,458	2,575	125.9
Luxembourg	1,000	301	301.0
Mexico	767,168	19,446	25.3
Monaco	.59	24	40,678.0
Netherlands	13,440	8,728	661.0
Netherlands colonial empire	832,686	67,666	81.2
New Zealand	104,751	1,640	15.3
Nicaragua	49,000	1,134	23.0
Norway (including Svalbard)	148,850	2,922	19.6

Name of State	*Area* (in Square Miles)	*Population* (000's omitted)	*Population per Square Mile*
Oman	80,000	500	6.3
Panama (exclusive of Canal Zone)	28,500	548	19.2
Paraguay	154,165	954	6.1
Peru (revised areas)	482,258	7,100	14.7
Poland	150,820	34,774	230.6
Portugal (incl. Azores and Madeira Isls.)	35,670	7,460	200.9
Portuguese colonial empire	803,836	9,405	11.7
Rumania	113,919	19,900	174.8
Salvador	13,176	1,744	129.3
San Marino	38	14	368.4
Saudi Arabia	800,000	4,500	5.6
South Africa, Union of	472,550	10,160	21.5
Spain	194,200	25,000	128.7
Spanish colonial empire	128,696	1,005	7.8
Sweden	173,347	6,341	36.6
Switzerland	15,944	4,210	264.0
Thailand (Siam)	198,247	14,976	75.6
Turkey	296,500	18,000	60.7
United States	3,026,789	131,670	43.5
United States territories and possessions	711,606	18,952	26.1
Uruguay	72,153	2,132	29.4
U.S.S.R	8,350,000	193,000	23.1
Vatican City	.17	1	5,882.4
Venezuela	393,976	3,467	8.8
Yemen	75,000	3,500	46.7
Yugoslavia	95,558	15,800	165.4
World Totals	55,910,294	2,640,252	47.2

Argentina, a republic on the Atlantic coast of southern South America and second largest country of the continent; language, Spanish; capital, Buenos Aires; president, Dr. Roberto M. Ortiz (acting president, Ramón Castillo). The area is 1,079,965 sq.mi., slightly over a third of that of the United States.

No official census has been taken since 1914, but the population was officially estimated (Dec. 31, 1939) as 13,129,723. The percentage of whites exceeded that of any other American country except Canada, with native-born of European stock, 76·9%, mixed bloods, 3·2% and foreign-born (almost entirely European), 19·9%. A majority was of Spanish stock, an estimated third of Italian or part-Italian. Nearly 250,000 were German or part-German in blood. The chief cities (with 1939 est. pop.) were in 1940: Buenos Aires, 2,364,263 (3,700,000 with its suburbs); Rosario, 513,000; Avellaneda (a Buenos Aires suburb), 386,000; La Plata, 248,000; Córdoba, 213,000; Tucumán, 147,000; Santa Fé, 147,000; Bahía Blanca, 115,000; Mendoza, 82,000; Paraná, 72,000.

History.—The government is federal in form with legislative power vested in a bicameral congress.

The political storm, brought on late in 1939 by Pres. Ortiz's determined campaign for honest elections, continued with greater fury in 1940, reaching its peak in March. On Feb. 19, the president exercised his constitutional prerogative and intervened in Catamarca province, setting aside fraudulent elections there. A few days later, after challenged elections were held in Buenos Aires province (pop. 3,500,000), similar action was taken there. As interventions were directed against the Conservatives, who had elected Dr. Ortiz in 1938, a political crisis was precipitated and two cabinet members resigned. Ortiz was largely deserted by the Conservatives and, in effect, went over to the Radicals. Congressional elections in March gave the Radicals control of the lower house of congress for the first time since 1930.

Full effect of the sweeping purge was prevented, however, by Pres. Ortiz's serious illness, which compelled him on July 3, 1940 to relinquish office to Vice-Pres. Castillo, an old-line Conservative entirely out of sympathy with his internal policies. In August political scandal rocked Argentina, as a senate investigating committee involved the minister of war in a huge land fraud. Although still bedridden, Pres. Ortiz temporarily resumed office and, declaring the charges to be a reflection upon him personally, tendered his resignation to congress. When this was rejected by a vote of 170 to 1 (Aug. 24), he again turned executive power over to Castillo. On Sept. 2, a new cabinet composed entirely of moderate Conservatives was organized.

Argentina's international relationships during 1940 were motivated by three major factors which tended to pull her in divergent directions: the activities of pro-nazi fifth columnists in the country and the generally alarming European situation; a long-standing close relationship with Great Britain; and a traditional distrust of the United States, accentuated by unsatisfactory trade relationships, but modified by the Roosevelt good neighbour policy.

The presence of the crew of the German battleship "Graf Spee," scuttled within the mouth of the Rio de la Plata in late Dec. 1939, brought serious problems. Propaganda activities of some of the "Graf Spee's" officers and men and the escape of many of them from internment aroused considerable Argentine resentment and served to turn public opinion more and more against the axis powers. Feeling was further intensified by revelation of the propaganda activities of the nazi-subsidized newspaper *Pampero* and of numerous fifth columnists. In the latter part of the year these activities centred especially in the northeastern territory of Misiones. Isolated from Argentina as a whole and nestling between Germanophile southern Brazil, politically unsettled Paraguay and fifth columnist infested Uruguay, Misiones was strategically nearly ideal for revolutionary activity by pro-nazi groups and great difficulty was encountered by the government in its efforts to suppress fifth columnism there and elsewhere in the country.

Argentine sympathy toward Great Britain, long her best customer and chief provider of imports, continued strong. British purchases of Argentine meats reached gigantic proportions, but full economic benefit was precluded by British impounding of the proceeds, a policy which brought about an acute shortage of foreign exchange with which Argentina might meet obligations elsewhere. In Oct. 1940 an Argentine cattlemen's committee formally offered to restock all visiting British warships with fresh meat free of charge and in December a similar group donated 6,000 head of cattle to the British government. On Oct. 11 British contracts for foodstuffs, especially meats, for the ensuing 12 months were reported to aggregate between £25,000,000 and £40,000,000 sterling.

Argentine relations with the United States revolved about two major sets of problems: economic and trade difficulties between the two; and hemisphere defence and their relations in general to the European war. The first arose from the competitive nature of the products of the two countries and the long-continued "unfavourable balance" of trade with the United States, with the United States' discrimination against Argentine meats, an additional irritant. Reciprocal trade negotiations carried on during 1939 were abandoned in Jan. 1940 in the face of strong opposition from cattle-producing sections of the United States and the internal political dangers involved. When Argentine purchases in the United States doubled during the early months of the year, the foreign exchange problem became increasingly acute and, in July, Argentina began restricting imports from the United States to the point of a virtual embargo in September. In Dec. 1940, however, credits of $110,000,000 were obtained from United States governmental agencies, with $50,000,000 allotted specifically to currency stabilization.

Closely tied to economic relationships with the United States was the question of hemisphere solidarity in the face of the European war. At the Havana conference in July (*see* HISPANIC AMERICA AND THE EUROPEAN WAR), although refusing assent to some of the more sweeping proposals, Argentine delegates gener-

ally worked in harmony with those from other American republics. Late in the year, strong protests were made at the proposed Uruguayan concession of naval base rights to the United States (*see* URUGUAY), although in general a willingness to join in hemisphere defence plans was indicated.

European developments had profound effects upon Argentina and stimulated a demand for the development of adequate defences. In July 1940 defence appropriations in excess of 1,100,000,000 pesos were approved. Owing to the extreme vulnerability of the 1,800-mi. coast line, strong emphasis was placed on naval and aviation improvement. Improvement of naval and air bases along the Patagonian coast was begun and, in November as part of a Pan-American defence co-ordination move, high Argentine army officials visited the United States to view that country's defence activities. During the year commercial treaties were made with Brazil, Colombia and Japan.

Education.—Education is free and compulsory. In 1938, 14,071 educational establishments (12,500 state-supported), with 2,074,000 enrolment (1,901,000 in state-supported schools) included 13,298 primary (enrolment 1,915,593) and 749 secondary schools (129,000 enrolment). Six national and one private university have over 28,800 students. The national universities of Buenos Aires and La Plata have high international standing.

Army and Navy.—Argentina has compulsory military or naval service. The army personnel numbers 49,705 active and 282,503 reserves. The navy, strongest in South America, comprises two battleships, three cruisers, 16 destroyers, three submarines and a number of smaller craft. There is a marine corps of nearly 4,000 and 470 aeroplanes of all types (over 100 first-class) supplement other defence forces.

Finance.—The monetary unit is the peso, valued (Dec. 1940) at approximately 23½ cents U.S. (unofficial rate). The 1940 budget as readjusted late in the year calculated 1,108,939,000 pesos expenditures, 915,864,000 pesos receipts, but in September, the actual deficit was officially forecast as 120,000,000 pesos.

Trade and Commerce.—In 1939, Argentina's imports (primarily textiles, petroleum products, machinery and miscellaneous manufactured goods) were valued at 1,338,332,419 pesos, a decline of 8·1% from 1938 and came chiefly from Great Britain (19·9%) and the United States (17·2%). Other countries supplying imports included Germany, 9·1% (1938: 10·1%); Belgium, 6·5% (1938: 5·2%); Brazil, 6·5% (1938: 4·7%); France, 5·6% (1938: 4·3%); Netherlands West Indies, 4·1% (1938: 3·7%); Peru, 4% (1938: 4·4%); British India, 3·9% (1938: 4·4%); Italy, 2·7% (1938: 2·7%); and the Netherlands, 2·4% (1938: 1·9%).

Exports in 1939 were 1,573,173,178 pesos, a 15·3% increase over 1938. Agricultural products comprised 48·7%; livestock, 43·7%; forest products, 3·04%; mineral products, 1·2%; others, 3·23%. The increase was due chiefly to a 17·2% rise in livestock exports. Exports were taken especially by Great Britain, 35·9% (1938: 32·8%) and the United States, 12% (1938: 8·5%). Germany took 5·7% against 11·7% in 1938. Other customers included the Netherlands, 8·1% (1938: 7·4%); Belgium, 7% (1938: 7·4%); France, 4·8% (1938: 5·4%); Brazil, 4·3% (1938: 7%); Italy, 2·1% (1938: 2·5%); Sweden, 2·1% (1938: 1·8%).

In the first 11 months of 1940, imports increased 17·9% over 1939, to 1,409,871,000 pesos (United States, 21·28%; Great Britain, 15·1%); exports declined 6·3% to 1,328,123,000 pesos (Great Britain, 36·37%; United States, 15·9%). In the first 9 months of the year, exports declined 18·2% in volume (livestock products by 9·1%, agricultural by 19·7%); livestock export values increased 11·3%, although agricultural export values were 8·4% less. Meats, off 5·5% in volume, rose 7·6% in value. New British contracts totalling nearly £40,000,000 were expected to enhance exports materially in 1941.

By far the greatest part of Argentine external commerce is handled through Buenos Aires, which is served by numerous steamship lines, and is the hub of the country's intricate railway system. Bahía Blanca to the south and Rosario on the Paraná are also important. Comodoro Rivadavia, in southern Patagonia, is the centre of the petroleum industry. Railway connections link the country with Bolivia, Paraguay and Uruguay. Communication with Chile has been by combination bus and railway service over the Transandine railway route since landslides interrupted through service in 1934 and by similar facilities through Bariloche and the lake region in the south. The Transandine, purchased by the government in 1939, is in process of reconstruction and rehabilitation. By a treaty with Bolivia in 1940 Argentina undertook to construct a 62-mi. railway from the border into the Bolivian oil fields. During 1940, shortage of shipping facilities due to European war disruptions precipitated some agitation for the development of an Argentine merchant marine. External air service by Pan American Airways via the east coast of South America was improved during the year by establishment of triweekly service and shortening of time between Buenos Aires and New York to 48 hours. There is almost daily Transandine service to Chile, frequent service to Montevideo and regular connections with Paraguay. Transatlantic service via Brazil formerly provided by French lines was suspended in 1940 owing to war conditions. A German service, suspended in Sept. 1939, was resumed in March but again abandoned in Nov. 1940. Internal aviation lines aggregate 10,607 km. in length.

In 1939 there were over 400,000 telephones in Argentina (over 50% of them in Buenos Aires), as many as in all the rest of the continent. State-owned telegraph lines totalled 47,270 km. in length. There were 48 radio broadcasting stations. Nine were state-owned.

Argentina has approximately 43% of all South American railway mileage and ranks sixth in the world, with a 1940 total of 42,099 km. (not including nearly 9,000 km. of port, industrial and other rail lines). The highway system exceeds 300,000 km. in length, with 17,000 km. paved. In 1940, approximately 97,000,000 pesos were spent on highway extension and improvement.

Agriculture and Livestock.—Argentina's revenues are primarily agricultural and pastoral, with 10·8% (74,130,000 ac.) and 44·4% (306,404,000 ac.) respectively of the country's area devoted to them. The chief agricultural products are cereals and linseed. The bumper 1939–40 corn crop of 10,640,000 tons was more than double the previous year's crop and exceeded the five-year average by 26%. The government appropriated 100,000,000 pesos to purchase the excess and experimented with unshelled corn for railway fuel. A large portion of the crop was converted into alcohol. A similar surplus of wheat (crop estimate, 3,251,000 tons) was likewise handled by government purchase on an understanding of reduction in acreage in 1941. Linseed, in whose production Argentina leads the world, was estimated at 1,014,400 tons. Other important grain crops (with 1940 estimated tonnage) were: oats, 872,600; barley, 851,100; rye, 345,000; birdseed, 26,500. Important non-grain crops include cotton (74,200 tons in 1940), grown principally in Chaco territory; sunflower seed (325,000 tons); sugar cane (521,600 tons in 1939); potatoes (1,161,000 tons). Fruits are extensively produced in Mendoza and other provinces along the eastern slope of the Andes and in Patagonia. In 1939, 51,369 tons of fruits were exported (pears and apples, 39,890 tons; grapes, 9,256 tons). Rice and tobacco are important, although considerable quantities are imported.

Agriculture and livestock together account for 90% to 95% of all exports. The livestock census of 1937 showed a total of 43,790,166 sheep, 33,100,152 cattle, 8,527,181 horses, 4,875,990

goats and 3,975,716 hogs. Beef and mutton, in canned and chilled form, are a leading export. Heavy British purchases of meat were anticipated for 1941. The dairy industry is increasing in importance. The fishing industry, although still small, is rapidly expanding.

Forest and Mineral Products.—Timber is very limited except in the subtropical north, where there is extensive development of quebracho, source of tannin, of which Argentina produces two-thirds of the world's supply. Quebracho exports in 1940 declined over 25%. Maté (Paraguay tea) is also heavily produced, chiefly for domestic consumption, but serious overproduction has developed since 1938.

There is very little mineral wealth other than petroleum, although some coal deposits exist in Neuquén territory. Argentina ranks 11th in world petroleum production, with a record output of 18,614,660bbl. in 1939 (1940 est.: 20,476,100bbl.). Fields in and around Comodoro Rivadavia in Chubut (southern Patagonia) account for over 75% of production. Other fields are in Salta and Jujuy, in the extreme northwest, and in Neuquén. State-owned fields provided 55% of the 1939 production. All new fields are reserved by law for state exploitation. Domestic production took care of 56·9% of Argentine consumption in 1939.

Manufacturing.—Manufacturing has undergone extensive development since 1933, especially under the stimulus of European interference with normal sources of supply. Credits granted by the United States Export and Import bank in Dec. 1940 were expected to go, in part, to aiding new industries. (L. W. Be.)

Arizona. The "Apache state," is a state in the southwestern part of the United States of America. It is bounded north by Utah, east by New Mexico, south by Mexico and west by California and Nevada, the Colorado river separating it from California and in part from Nevada. One of the two youngest of the United States, it was admitted with New Mexico in 1912. Area, 113,956 sq.mi.; population, according to the U.S. census of 1940, 499,261. The capital is Phoenix with a population of 65,414. Of the total population of 435,573 in 1930, 264,378 were native and foreign-born white, 10,749 Negroes and 160,446 other races, chiefly Mexican and Indian.

History.—The state officials in 1940 were: chief justice, Henry D. Ross; governor, Robert T. Jones; secretary of state, Harry M. Moore; attorney-general, Joe Conway; treasurer, William Peterson. At the November election of 1940 Sidney P. Osborn was elected governor; Joe Hunt, treasurer; and Alfred C. Lockwood became chief justice. In the presidential poll Roosevelt received 95,267 votes; Willkie, 54,030. Ernest W. McFarland was elected U.S. senator, having defeated Senator Henry F. Ashurst in the September primary. Governor Jones called a special session of the legislature late in September to consider a number of measures. Six of these were passed: provision for eradication of dourine; amendment of the unemployment compensation law of 1936 to conform to the provisions of the railroad unemployment insurance act; provision for tax anticipation bonds; authorization of city bonds for waterworks; creation of a Coronado centennial commission; and confirmation of six recess appointments.

SIDNEY P. OSBORN, a Democrat, was elected governor of Arizona Nov. 5, 1940

Charities.—In Nov. 1940 there were 38,664 persons receiving some form of public aid, with a total monthly expenditure of $443,170.74.

The number aided was in excess of that for the same period of the previous year, but the expenditure was less.

Agriculture and Mining.—Citrus fruit, cotton, lettuce, and beef cattle comprise three-fourths of the value of farm products of Arizona. Arizona is the sole U.S. producer of Egyptian or long staple cotton. In 1940 there were 156,000 ac. of short staple with an estimated production of 159,000 bales, and 66,000 ac. of long staple with an estimated production of 37,000 bales. Arizona excels in the production of beet sugar seed with 4,360 ac. harvested in 1940. Grapefruit was estimated at 2,700,000 boxes from 14,000 ac. Two crops of lettuce were harvested. The spring crop for 1940 was 7,325 cars from 13,900 ac. The production for the previous autumn which continued into 1940 was 4,821 cars from 15,000 ac. Owing to the continued high price of copper, production of that metal for 1940 probably exceeded that of 1939 which was 518,400,000 pounds. The Phelps Dodge corporation continued its development work at Morenci. A wage increase of 5% became effective Oct. 7 for several thousand miners at various mining centres in the state. (H. A. H.)

Arkansas, twenty-fifth state of the United States, is one of the south-central states. Its boundaries are north Missouri, east the Mississippi river, separating it from Tennessee and Mississippi, south Louisiana, and west Texas and Oklahoma. Its area is 55,335 sq.mi.; population (1940), 1,949,387. Capital, Little Rock, 88,039; Fort Smith, 36,584; Hot Springs, 21,370; North Little Rock, 21,137; Pine Bluff, 21,290; El Dorado, 15,858; Texarkana, 11,821.

History.—The following state officials, all Democrats, were inaugurated on Jan. 14, 1941, for a two-year term: Homer M. Adkins, governor; Bob Bailey, lieutenant governor; C. G. Hall, secretary of state; Jack Holt, attorney-general; Otis Page, land commissioner; Earl Page, treasurer; J. Oscar Humphrey, auditor; J. S. Holt, associate justice of the supreme court.

The outstanding events of the year were the elections, primary and general. Governor Carl E. Bailey sought a third term, but Homer M. Adkins defeated him by a large majority. Three other officials were elected for third terms. The communist party was ruled off the ballot by Secretary of State Hall on the ground that it did not "subscribe to the principles of Americanism." The party did not appeal to the courts. In the presidential election Mr. Roosevelt received 158,622 votes, Mr. Willkie 42,224. Roosevelt's vote was larger than in 1936, but smaller than in 1932. Willkie's vote was larger than that of Landon in 1936 or of Hoover in 1932. Adkins, Democratic candidate for governor, received 184,578 votes; Stump, Republican, 16,600.

Education.—The amount spent on public schools for 1939–40 was $14,023,914. The number of children of school age was 624,575; number enrolled, 472,014; the average length of the school term was two days short of eight months. Commonwealth college, which was founded 18 years ago to train labour leaders, was fined $2,500 in Sept. 1940 in a justice of the peace court on a charge of "anarchy, displaying an illegal emblem, and failure to display the United States flag." No appeal was taken. In December the library and other movable property were sold to pay the fine. The college was closed in 1940.

Banking and Finance.—The number of national banks has been reduced to 49 by one failure. Two state banks failed and several were liquidated. Otherwise the banks, state and national, had

a prosperous year, the loans, discounts and deposits being considerably larger than in 1939. The assessed valuation of property in 1940 was about $160,000,000 below that of 1929. Tax delinquencies were large, especially on personalty, but the special taxes collected in 1940 were $2,000,000 above those of 1939, the tax on gasoline being 6% higher. There was an increase in the severance tax collections, due to government orders for timber.

HOMER M. ADKINS, Democrat, won Arkansas's gubernatorial election Nov. 5, 1940

Agriculture, Manufacturing and Mining.—The total income of the state for 1940 was $447,000,000, a new high for ten years. The decline in cotton acreage was 3,933,000 in 1933 to 2,187,000 in 1939, but the decline in production was only from 1,435,000 to 1,410,000 bales. There was an increase in livestock of 10.4%, that in hogs being 100%. The estimated production for 1940 was somewhat higher than for the previous year: cotton, 1,540,000 bales, worth $73,389,500; cotton seed, 687,031 tons, worth $15,801,713; corn, 42,903,000 bu., worth $28,874,160; hay, tame and wild, 1,349,000 tons, worth $10,255,420; rice, 10,047,000 bu., worth $6,831,960; Irish potatoes, 3,895,000 bu., worth $3,310,750; sweet potatoes, 2,975,000 bu., worth $2,677,500; apples, 675,000 bu. worth $711,450; grapes, 9,600 tons; pears, 204,000 bu. The total value of all farm products probably will run over $145,000,000. The apple crop suffered a decline, partly because of discriminatory freight rates. The grape growers were helped by grape juice and winery plants. There was a decrease in mortgage debt from $99,000,000 in 1929 to $63,000,000 in 1940 and a lowering of interest by 50%. Six years ago a young Arkansas couple started out as tenant farmers with $25.19. They have since purchased 38 ac. and in 1940 they had a total income of $3,042 and won the $500 mid-south sweepstakes over 41,328 contestants. Thrift, diversified farming and intelligent planning did it. New and expanded manufacturing plants added $570,200 to investments. The leaders were lumber, 53 plants with $1,168,500; mining, quarrying and milling, 28 plants with $1,114,000; refineries, two plants with $1,000,000; food, 36 plants with $426,500. The tourist industry reached $500,000. The building industry was the largest since 1929. The construction of Camp Joe T. Robinson for military training near Little Rock utilized 39,500 ac. and caused the moving of 340 families, over half of whom were owners. The mineral production rose from $13,000,000 in 1933 to $26,000,000 in 1939 and $32,974,389 in 1940. The leader was petroleum, 25,758,367 bbl., worth $21,268,070; followed by coal, 1,127,588 tons, worth $3,980,388; bauxite, 475,507 long tons, worth $2,724,660; natural gasoline, 19,000,000 gal., worth $665,000; and stone, 417,162 tons, worth $553,356. Lead, zinc and cinnabar felt the impulse of the defence program. The increase in coal was largely because of the demand of St. Louis, Mo., for something to abate the smoke nuisance. (D. Y. T.)

Armies of the World.

The principal armies of the world met in great military engagements during the year 1940. The armies of the dictator states were opposed to the democracies in Europe, in Africa and in China. The year opened with continuation of the war between Germany and the Allies, England and France. Russia was at war with Finland. The Japanese continued their invasion of China.

The campaigns in Europe revealed the characteristics of the contending armies. Germany, Denmark, Norway, Holland, Belgium, France, England and Italy—eight armies in all, were engaged in combat during a part or all of the year. This review of these armies has been made in relation to the campaigns. Censorship and other restrictions limited the accuracy of information available for consideration. The armies have been considered in turn, in relation to prewar conditions and the results of the principal campaigns. Complete analyses should include examinations of naval activities and those political developments leading to or resulting from combat.

The German Army.—*Man Power.*—The German army was mobilized, victorious in Poland and engaged in war as the year opened. Prewar estimates placed the strength of the army at slightly more than 8,000,000, including semi-military organizations. Wartime estimates indicated about 6,000,000 men actively engaged, while a reserve potential of 2,000,000 could be made available for service. These estimates included about 380,000 for the air services, which constituted a separate force. In peacetime, the army consisted of around 55–65 divisions. In wartime, a total of 150 or more divisions could be organized. The air services were estimated to include around 350 active and 150 reserve squadrons.

Theory of Combat.—While the theory of combat was based on the immutable principles of war, the German army adopted a method of application popularly known as blitzkrieg or "lightning war." This theory was developed as a result of the provisions of the treaty of Versailles. Germany was permitted an army, the reichswehr, of 100,000 officers and men. Severe restrictions on arms and equipment, including practically complete disarmament, were designed to prevent the rise of German army strength. General Hans von Seeckt, head of the German forces, developed the theory that due to limitations on size, the German army could be employed only in a short war. Developments in mechanical weapons, tanks, aviation, etc., prompted the adoption of such an approach. His view was that a small army well equipped, could wage successfully a short war against a nearby opponent before the enemy could fully mobilize its strength. Previous German military leaders had developed the idea of infiltration of small units to overcome the great defences in depth of the war of 1914–18. The theory of "lightning war" was an extension of this development permitting repeated employment of independent units operating against weak spots in enemy defences to create openings for the advance of heavily armoured and mechanized units to exploit the gaps and pave the way for large masses of infantry-artillery ground forces. (*See* LIGHTNING WAR.)

Denmark-Norway.—The German invasion of Denmark met with little resistance, and occupation was completed without open conflict between the German and Danish forces. The objective in Denmark was limited to the occupation of that country in order to establish air and naval bases for launching an extended invasion into Norway. In addition, Germany sought bases to protect shipping through the Cattegat and Skagerrak.

The invasion of Norway by the German army was a carefully planned employment of the German theory of lightning attack. The principal objective of the German army was the capture of air and sea bases to deny them to Britain. Shipments of Swedish ore would be protected and German access to the sea assured. Large German forces were not employed. Germany placed naval forces disguised as merchant sailors in commercial vessels within the open harbours of Norwegian ports. These forces seized and held a number of landings for German units. The first stage of the battle between air and naval forces was inaugurated during

the campaign. Great Britain employed only a small part of her naval forces. German land units were sent to Norway by air and sea. Norwegian forces were small. Large masses of German ground forces were not needed, since terrain features, distances to be travelled and the time factor precluded their use.

Holland.—The campaign in Holland was minor and preliminary to the main effort through Belgium. It illustrated only two phases of the new methods of war; *i.e.*, war of nerves (fifth columnists) and aerial parachutists and aerial infantry. The employment of parachute troops and air infantry resulted in spectacular success, due to surprise and novelty of attack. Parachute troops seized and held the Moerdijk bridge, outflanking the main Dutch water defences and cutting off reinforcements from the south. The German-Holland border was the closest outlet for German approach to the North sea. The water defences of Holland actually limited the manoeuvre area for Dutch forces. These terrain features, the seacoast and flooded border defences, determined the German plan of invasion. Germany attacked from the air to seize critical points in the back areas and to capture points that would insure the rapid advance of the main ground forces. Once these bases were captured Dutch defences were reversed, and later disorganized. Germany had quick access to undefended Dutch seaports.

Belgium.—The invasion of Belgium was simultaneous with the invasions of Holland and Luxembourg. These invasions were all one campaign. They covered the front of the main German operations while lesser forces held before the Maginot line. The German approach to battle indicated the same idea of the von Schlieffen plan of 1914. An advance through Belgium would turn the French left and the Maginot line, and at the same time secure bases in Holland, Belgium and northern France for later operations against Britain. Valuable supplies, principally gas and oil, were additional objectives.

Air and ground forces in close co-ordination operated with initiative and aggressiveness against weak spots in the Belgian defences. The principal advance of German forces developed toward the heavily wooded Ardennes. Once through these defence positions, the German forces would be able to direct their advance toward Sedan. A critical part of the campaign was the decision of the Allied high command to leave the prepared positions along the French and Belgian frontiers and move large forces to the assistance of Belgium and, if possible, to the assistance of Holland. This decision meant that Allied troops would advance beyond the defensive line of the Meuse river and that the Allied left flank would be pushed out in the direction of Holland. Thus the Germans developed a "soft spot" north of Sedan, defended by few forces who apparently neglected to block advances by fighting or by destruction of the Meuse bridge. The Germans grasped this opening to push through large mechanized units in a great encircling movement. It is believed that the Germans did not necessarily "plan the campaign that way"; rather their methods were so flexible that they took advantage of the opening given them by the weak Allied forces, including the French army north of Sedan. The composition and organization of the German army indicated again that all units were trained to take advantage of air and mechanized weapons, and were led with initiative and aggressiveness along the lines of tactical opportunities created by local successes which were encompassed in a general strategical plan. While these operations are indicative of the co-ordinated efficiency of the German army, further study of reliable data may disclose such serious defects in the Allied actions as to present a somewhat different picture.

Retirement of British and French forces after their offensive into Belgium and eventual surrender of the Belgian army in Flanders, as well as the apparent failure on the part of these forces to make effective the decisions of higher commanders to launch counterblows, are controversial questions for the study of future historians. Reliable information and actual facts available for sound conclusions accept that there is evidence that the mass of the Allied air forces were employed on distant strategical areas when better results might have been achieved by more direct support of the ground forces. These conclusions are supported by the change of air tactics during the withdrawal from Dunkirk where it appears that royal air forces secured such an air supremacy as to permit this complicated operation with relatively small losses to personnel. German air bombardment of Great Britain coupled with air and submarine attacks against supply lines continued throughout 1940 without decisive results. While attempts at invasion of Britain were alleged, evidence is not definite on this point.

Germany faced the questions of an immediate invasion of Great Britain, while German superiority was greatest, or the immediate subjugation of France, or a combination of these operations. Germany chose the course of immediate destruction of the remaining French forces, south of the Somme river. It is too early, and accurate facts available are too few, for definite comment on this decision. However, after the crossing of the Somme, General Weygand's efforts to meet the German advance appeared futile. Italy's entry into the war with a threat against the French flank and rear played further on the lowering French morale, so that finally real resistance disintegrated and French authorities accepted an armistice on German terms. Thereafter, the German army was employed on the continent in occupation of the conquered countries and in furthering the political extension of German national policy in the near east.

The air battle over Britain may be considered the attrition type of warfare. Observation flights were made to determine the character of British defences. Mines were laid by parachute along the coastal waterways. Industrial concentrations and other military objectives were bombed. Germany initiated full scale bombing against centres of civilian population. Attacks were made against merchant shipping, and patrol planes co-operated with submarine fleets. The principal activity of the German army was the employment of the air arm independently without the use of ground forces. Some heavy coastal artillery from positions along the French channel coast launched bombardment attacks against British coast defences.

The British Armies.—*Man Power.*—Prewar estimates indicate that the British forces approximated less than 600,000 including trained reserves. Air forces, including reserves were estimated at 80,000 to 85,000 officers and men. Conscription of man power offered the potential increase of approximately 4,000,000. In peacetime, about 10 to 15 divisions of all categories were active; however, only about one-third were well equipped and trained. In war this total could be expanded to provide up to 100 divisions, provided adequate modern equipment was made available. Any estimate of British man power must take into consideration the theatre of operations. Joined with an ally in a foreign theatre of operations, the size of British expeditionary forces is determined by the requirements of local combat. As an example, no force was sent to Poland in 1939. Time and distance determined the requirements of the local combat and prevented British participation. In France, British forces were estimated at not more than ten divisions.

Restrictions of censorship weaken the conclusions drawn. Irrespective of the final issue of campaigns in France, the British view of the particular requirements of that theatre and availability of munitions, determined the actual forces employed.

At the close of the year, Great Britain was fighting a purely defensive war on the home front. Under threat of invasion, the British forces increased enormously. Expansions in the home

guard, and the gradual inclusion of nearly all able-bodied citizens in defence works made any estimate a guess. Conservative estimates indicated that the home guard measured 1,700,000, armed and trained for defence service.

The defence of self-governing dominions is a dominion responsibility. However, dominion expeditionary forces were employed by Britain in the Mediterranean area and in Greece. Those forces, principally Canadian and Australian, were added to the small regular British garrisons and the local native troops in Egypt, Somaliland, Kenya and Palestine. British forces in the near east and in Africa were estimated at around 200,000.

In the air, British squadrons in peacetime were estimated at about 200, with approximately 50 of those in overseas possessions. No reliable estimate can be made of pilot strength in 1940 or over-all strength of the royal air services, due to wartime censorship.

1940 Campaigns.—The principal campaigns for the British forces were in Denmark and Norway, Holland, Belgium, France, North Africa and Greece. With the exception of air bombardment of Danish bases, Britain made little effort to prevent German invasions. In Norway, the size of British forces, the inadequacy of equipment and the apparent limitations on air and naval support, indicated that Britain was not prepared to resist strongly the German invasion. The British army played an unimportant role in Holland. Small naval units effected the withdrawal of British residents and the royal family. Some air units bombarded channel ports. In the Belgian and French campaigns the British played a principal part. British forces moved north into Belgium to aid King Leopold's armies. The dispositions proved to be unfortunate in providing opportunities for the advance of large German mechanized troops against weaker British ground forces. The air forces did not offer continuous assistance and mechanized forces appeared short in essential equipment. British forces withdrew behind Brussels and large numbers were eventually encircled. To the south, the British defended stubbornly around Dunkirk and succeeded in withdrawing the major portion of their forces. British losses in equipment were high, while available information does not indicate excessive losses in personnel.

In the Mediterranean area British forces were successful against larger Italian forces. The Italian invasion of Egypt was permitted with a view to forcing overextension of Italian supply lines. The Italian operations near Kenya and along the Abyssinian border were considered of minor importance. The invasion of Greece gave Britain the opportunity to occupy Crete, well located for employment of air raiders against southern Italy and to protect the Mediterranean. In the Mediterranean and North African areas, British forces were more actively engaged in direct offensives against Italian air forces and in conjunction with Greece were operating against Italy in Albania.

Theory of Combat.—The general war policy of the British is based upon defence of the outlying posts of empire and defence of the home front. Great Britain relies upon small regular garrisons in her possessions, increased by local native forces. All defence considerations rest upon the initial use of naval power. Sea power, rather than ground or air power, has always been the great potential of British strength. The rise of British air power results from necessity and is coupled with the need for home defence, as well as the air needs of the empire. Britain places great dependence upon naval blockade and control of the sea lanes of the world.

The theory of combat on the field for Britain has been the policy of defence; a defence strong enough to hold up an enemy offensive and eventually permit the delivery of a counterblow. The European war will no doubt develop these theories along lines of aggressive action with greater co-ordinated employment of the three arms—navy, air and army.

There were signs of growing aggressive action by all arms in the operations against Italian troops, while the air arm continued to deny complete superiority to Germany over Britain. The tactical grouping of British air units consisted of a fighter command, including pursuit ships and anti-air defence units; an offensive command of bombers; and a coastal command for channel defence. To these should be added air forces with the navy.

The French Army.—*Man Power.*—Prewar estimates of the army in France indicated a strength of slightly more than 500,000, not including reserves. The peacetime division strength was placed at 35–40 with an estimated war increase to 150 divisions. Air forces were estimated at around 50,000 men with about 3,000 planes and approximately 60 active squadrons. Wartime army strength was estimated at 5,000,000 with a potential increase of 2,000,000 native troops of all classes. It is conservatively estimated that in 1940 France had an army in the field of close to 2,000,000 men, with at least another 1,000,000 in training. Air force figures were unreliable but the results of campaigns indicated less than above for the initial estimated strength on Sept. 3, 1939.

Theory of Combat.—The French theory of combat depended primarily upon the defence of fortified frontiers supported by counterattacks against an invader. The postwar period since 1918 was marked by French efforts to create political and military alliances to secure a potential strength which would delay invasion and produce sufficient forces to permit counter-offensives. The construction of formidable land defences and the reluctance to cross a frontier in preventative war were outstanding examples of this French theory of defence combat.

Campaigns—Belgium.—While holding the Maginot line with fortress troops, French forces with light equipment were moved from prepared positions along the frontier into Belgium to meet the German invasion. It appears that these French forces were inadequately equipped and were too small in numbers to stem the German advance. Contrary to the accepted doctrine of defence, these French forces assumed the offensive in what appear to be unco-ordinated efforts, advancing even beyond the line of the Meuse river. The continued thrusts of German mechanized columns through the Ardennes met slight resistance. The use of heavy tanks and the continuous and close co-operation of German air forces in the ground fight quickly overcame French, and later British, resistance. At no time did the French mechanized forces equal in number or in armament the strength of the invading columns. There appears to have been a shortage of mobile artillery and air forces. In this move failure to appreciate early the tactical situation created by the German advance along the Somme, coupled with the Belgian and British reverses, permitted the German outflanking advances to Amiens and the coast and eventually caused the collapse of the Allied operations by the withdrawal at Dunkirk. The French troops escaping this debacle joined Weygand's operations south of the Somme river and to the east.

The battle of France south of the Somme river is a striking example of the composition and organization of the French army employed in open warfare. French distributions resulted from hastily made decisions in view of the deep infiltration by independent German units. Liaison between French units was weak. Prepared defences were inadequate against co-ordinated air and ground attack. French forces lacked mobile weapons of all types and were particularly short in air and mechanized equipment to overcome the German air and mechanized columns. Apparently France counted too heavily upon stubborn Dutch and Belgian resistance and the impregnability of the Maginot line. National and military morale appeared below that essential to meet the sacrifices of such a war. The French organization for a war of movement was handicapped due to general reliance upon a defence attitude and not an offence or aggressive determination.

Summary.—The actual break-through, the encirclement and destruction of large French forces cannot be analyzed completely during conditions of wartime censorship. The army in France was decisively defeated. French forces in Syria and in Africa appeared to be immobilized, yet stood as a threat in the Mediterranean. A small force under General de Gaulle, known as the Free France army, has continued minor engagements allied with British forces in Africa. At the close of 1940, a principal power, France, had been decisively defeated and eliminated as a major force in conduct of warfare in western Europe.

The Italian Army.—Man Power.—Prewar estimates indicate a total strength of 7,000,000 including reserves. Wartime estimates subject to censorship indicate a total man power of about 2,500,000 in service, with a trained reserve potential of close to 5,000,000. The number of divisions in peacetime approximated 50–55. Wartime strength is perhaps 150 divisions. Air forces in peacetime were estimated at around 200,000 men, including reserves. First line craft were assumed to be close to 4,500. The Italian army was distributed about as follows: In North Africa, an army of about 250,000. In Abyssinia, operating against British and French colonies, an army of about 110,000. Italian forces in Albania were estimated at around 100,000. There appeared to be considerable shortages in modern equipment, principally mechanized and in the air arm. Italy appeared to have difficulty in securing adequate stores of raw materials to permit production of modern equipment required to maintain armies in the field.

Theory of Combat.—The Italian theory of combat is the result of World War experience, 1914–18; the successful invasion of Abyssinia; the successful participation in the defeat of France and the invasion of Albania. The theory includes the initiation of attacks from heavily defended bases, with primary reliance on the air arm and the navy. Operations against untrained, poorly equipped troops in Abyssinia and the invasion of Albania were the only campaigns on which an analysis could be based. A review

Above, left: AT THE FIRST ONSLAUGHT of the German invasion, Dutch sappers blew up the bridge over the Maas river at Maastricht, but rubber boats carried nazi troops across the river and enabled them to sustain their attack

Above, right: BRITISH TROOPS practising with "Molotov cocktails" in 1940. These are bottles filled with explosives which are thrown at tanks and armoured cars. Highly effective, they were first used by Spanish Loyalists

Right, centre: RUSSIAN SHOCK TROOPS in one of the much-publicized "armoured sledges" drawn by a tank assaulting Finland's Mannerheim line in Feb. 1940.

Below, left: U.S. PARACHUTE TROOPS learning how to land properly at a training school established in the summer of 1940 at Hightstown, N.J.

Below, right: STUDENTS of the British army school of sniping near Aldershot observing the effects of camouflage in hiding a sniper

of 1940 campaigns indicated that the Italian theory of aggressive air combat has been sorely disproved in combat.

Campaigns—France.—Italy declared war on France June 10, 1940. France requested an armistice from Italy ten days later. During those ten days, Italian air forces made bombing raids and reconnaissance flights in southern and southeastern France. Some mountain troops crossed the French-Italian frontier and were engaged in reconnaissance patrols when the armistice was signed.

Greece.—The Italian invasion of Greece began on the 28th of Oct. 1940. The size of the Italian forces indicated a probable strength of around 150,000. The objective of the Italian army appeared to be bases for operations against the British in the Mediterranean. The theatre of operations included the easily fortified and defended mountain approaches along the Greek-Albanian frontier. Italian activities were confined principally to the slow approach toward the so-called "Metaxas line" in an attempt to take the critical points leading to the main routes into Greece. Italian columns appear to have been lightly equipped in mechanized and armoured units. In the air, Italy had not established air superiority at the close of 1940. The defeat of the Italian columns in western Greece appeared due to inability to maintain uninterrupted advances of men and transportation in the face of stubborn resistance. Reports indicated that security measures were inadequate. Little regard appears to have been given to the effects of weather on such a campaign. At the year's end, the Italians were on the defensive.

Libya.—Italian forces in Libya invaded Egypt on Sept. 12, 1940. The Italian troops moved cautiously along the northern coast in the direction of Sidi Barrani, which was evacuated by the British Sept. 16. All these gains and much more, however, were lost before the end of the year. On Dec. 9 the British, who in the meantime had assembled considerable mechanized equipment, started a counteroffensive which recaptured Sidi Barrani in two days and later swept the Italians out of Egypt. By Dec. 16, with the fall of Fort Capuzzo, the Italians were on the defensive in Libyan territory.

Armies of the Lesser Powers. *Denmark.*—The Danish army, prior to the outbreak of war in 1939, was a small force of approximately 10,000 with a war potential of no more than 100,000. No resistance was offered to the German invasion and the actual conditions relating to the Danish forces at the close of 1940 were obscured by the censorship of German occupation.

Norway.—Prewar estimates placed the full strength of the Norwegian army at about 15,000 with a war potential of an additional 120,000. The invasion by Germany resulted principally in coastal defence activities and isolated small engagements by independent forces. As in Denmark, the theory of combat was entirely defensive, and following the German victories, information in regard to the Norwegian forces remained unavailable.

The Netherlands.—The Netherlands army was estimated to be approximately 600,000 including reserves, prior to 1940. The invasions in Denmark and Norway and the threat of invasion against Holland resulted in a complete mobilization. On invasion, it was estimated that about 500,000 were in active service. The speed of invasion and the destruction of the main resistance in a period of four days indicated inadequate strength. The theory of combat of the Netherlands army was entirely defensive. Agreements had been reached with Belgium and with the Allies looking toward support against invasion. Dutch air forces were hopelessly inadequate. Great reliance was placed upon border defences and water areas. Stubborn resistance was offered in the initial stages. Dutch forces were well equipped with light weapons considered adequate to defend along the border. The co-ordinated air and ground attack proved too powerful for Dutch defences in open warfare. No anti-mechanized equipment was available against heavily armoured German columns. Anti-aircraft defences were inadequate to overcome German air superiority. The conclusion of the campaign found most of the Dutch troops still intact despite heavy losses in the few major engagements.

Belgium.—The Belgian army was estimated to have prewar strength of about 600,000, not including reserves. Full mobilization of the Belgian forces in the face of German invasion increased this estimate to about 800,000. Air forces were small and ineffectual. The army was well equipped with light weapons and was considered to have organized defensive positions to delay a German advance. Large fortresses were completed and manned. Secondary defences had been constructed and were accessible. The result of the German invasion proved conclusively that the Belgian army had no defence against co-ordinated air and ground attack. The speed of the German advance and the confusion and loss of life created among the civilian population resulted in the ultimate surrender of Belgium. The theory of combat of the Belgian army was entirely defensive. There had been preliminary discussions with Holland, France and Britain looking toward eventual co-operation in the defence of the country.

Greece.—The estimated strength of the Greek army was 150,000, with a potential war reserve increase to about 550,000. The army lacked modern equipment and air forces were practically non-existent. The theory of combat was entirely defensive. The Greek operations against Italy indicated vigorous action of independent units along the Albanian frontier defences. Full information on the size and organization of Greek forces and British aid, was not available.

The Far East. *Japan.*—In 1940 estimates indicated that the army numbered over 6,000,000, including reserves. Japan employed some 2,000,000 men in China. Japanese forces were relatively well equipped with modern weapons and organized to conduct long range war against Chinese forces. The conduct of operations indicated that Japanese troops were successful in large attacks against organized Chinese forces. However, they had much less success against Chinese guerrilla tactics. The great expanse of country, difficulties of terrain, composition and organization of enemy forces and delays in supply, all contributed toward denying the Japanese decisive victories. The Japanese theory of combat was offensive, capitalizing on a religious personal devotion to the head of the state. Military activities were so closely identified with the extension of political policies that a distinction in a purely military sense is difficult to determine. The Japanese objective appeared to be the conquest of China, and eventual extension of control throughout the south China area. While large areas were occupied, the capitulation of the Chinese government or the destruction of its army was not accomplished.

China.—A conservative 1940 estimate indicated the strength of the armies as approximately 3,000,000, including reserves. The development of guerrilla warfare indicated increases to 5,000,000. In most modern weapons, including aviation, Chinese forces were inadequately equipped. When equipment was available and opportunities for training permitted, Chinese forces in large numbers fought in major engagements with some success. The theory of combat of the Chinese army was entirely defensive. The Chinese army appeared to be unable to prepare and launch a major attack against Japanese forces. The organization of the army appeared to depend upon availability of supplies of modern weapons, continuity of supplies of manufactured articles of all classes and the creation of a national attitude in regard to the promotion of a military policy. Major Chinese success appeared to be the result of slow-motion guerrilla warfare and the slow attrition of the invading forces.

The United States.—Expansion of national defence programs resulted in an increase in the size of the regular army. The Selective Training and Service Act of 1940, and induction of national guard organizations into federal service for 12-month periods have also added to the numbers in training for the army. The program visualizes a force of around 1,400,000 men and 12,000 aeroplanes available in 1941. Plans also call for the creation of an industrial plant capable of supplying an army of 4,000,000. In 1940, these plans were still in the formative stage, some 400,000 men being in service. Army forces were designated tactically as four field armies, each training in an assigned area of the country. Provision of housing facilities and construction of training camps were undertaken in 1940. The acquisition of additional air and sea base sites in the Atlantic were new responsibilities for the army. The greatest difficulty appeared to be the creation of an industrial plan permitting rapid production of modern arms and other equipment required. National industrial capacity was considered more than adequate to meet the demands of the defence program. The factor of time was, however, the greatest handicap.

Labour adjustments, establishment of priorities in raw materials and considerations for supplying aid to other democracies were additional factors influencing the development of the expansion program.

The defence policy of the United States had expanded to include the adoption of a defence of the western hemisphere. While no information was available as to the manner of implementing this policy, it appeared that the United States had adopted a plan calling for a large and permanent increase in her peacetime strength, and was engaged in a vigorous expansion and training program to prepare armed forces in the event of war. (*See* DEFENCE, NATIONAL; SELECTIVE SERVICE.)

Conclusion.—At the close of 1940, 13 armies had been engaged in warfare on three continents. The offensive had been undertaken or continued by Germany, Italy, Russia and Japan against Great Britain, France, Denmark, Norway, Holland, Belgium, Finland, Greece, China, Indo-China and Thailand. Six nations had been invaded and defeated, their armies dispersed or held captive by the invader. Russia had overrun Finland and absorbed the small border states of Latvia, Lithuania and Estonia. In addition, Russia had secured nearly one-half of Poland and a considerable portion of her war of 1914–18 losses in Rumania.

Germany had won decisive victories on the western European continent and threatened the security of the British Isles. Italy had begun invasions against Greece and Egypt in the Mediterranean and was engaged in a major struggle with British power in the near east. Earlier alliance with Germany had resulted in a short but satisfactory victory over France.

Japan continued the occupation of a part of China and despite the attrition of a long war, had expanded operations to the south. The end of the conflict of the armies of the world was not in sight. (*See* also AIR FORCES; CHEMICAL WARFARE; EUROPEAN WAR; MARINE CORPS; MUNITIONS OF WAR; NATIONAL GUARD; NAVIES OF THE WORLD; STRATEGY OF THE EUROPEAN WAR; TACTICS IN THE EUROPEAN WAR.) (H. A. DR.)

Arsonval, Jacques Arsène d' (1851–1940), French physician, was born in La Porcherie, Haute-Vienne, June 8, studied at the colleges in Limoges and Sainte-Barbe, and received his medical degree in 1877. He devoted himself to the study of heat as a curative agent, using electric current and developing devices to make it effective. His discoveries were not generally utilized until the World War of 1914–18, when the therapeutic value of the electric current was recognized. Dr. Arsonval served for years on the faculty of the Collège de France and when he retired his successor referred to him as "one of the great physicians of our time." His death at his estate near Limoges was announced Dec. 31.

Art: *see* AMERICAN LITERATURE; ARCHITECTURE; PAINTING; SCULPTURE; etc.

Art Exhibitions. Because of the European war, there was little art activity in the old world and the only important exhibitions were those held in the United States. Cultural understanding among the Americas was furthered by the Art of Argentina at the Virginia Museum of Fine Arts, Latin American Fine Arts at the Riverside museum, and Portinari at New York's Museum of Modern Art and at the Detroit Institute of Arts. Many attractive exhibitions reviewed the art of a period or people, among these three of the year's finest:

the Arts of the Middle Ages at Boston's Museum of Fine Arts; 6,000 Years of Persian Art arranged by the Iranian institute, New York; and the Carnegie institute of Pittsburgh's Survey of American Painting. Pre-Columbian art in the Americas was seen at the Los Angeles and Fogg Art museums; and Four Centuries of Venetian Painting at the Toledo Museum of Art. San Francisco's M. H. de Young Memorial museum presented the admirable Painting of France since the Revolution, sponsored by the French government and shown previously in Buenos Aires and other South American capitals. Other events included Chinese Ceramics at the Cleveland Museum of Art; Chinese Art at the St. Paul gallery, St. Paul; 20 Centuries of Mexican Art at New York's Museum of Modern Art; Northern Painting: 1400–1700 at the William Rockhill Nelson gallery, Kansas City; and at Wildenstein's, the School of Fontainebleau and French Sculpture from the David-Weill collection.

New York's world's fair and San Francisco's Golden Gate exposition again featured old masters and contemporary art. There were the usual annuals and biennials, some regional, some national. There were a number of exhibitions devoted to the work of 20th-century artists, arranged both by museums and dealers: Picasso at the Art Institute of Chicago; Rouault prints and paintings at the Buchholz and Bignou galleries, and most important of all at Boston's Institute of Modern Art (later to the Phillips Memorial gallery, Washington, D.C., and the San Francisco Museum of Art); Frank Lloyd Wright at Boston's Institute of Modern Art and New York's Museum of Modern Art; the late Paul Klee at the Buchholz and Nierendorf galleries; Ozenfant at the Arts Club of Chicago and at the San Francisco Museum of Art; Kokoschka at the Galerie St. Etienne; Epstein at the American Fine Arts galleries; Vlaminck at Wildenstein's; Siqueiros at Pierre Matisse's; Franz Marc at Buchholz'; José de Creeft at Passedoit's; Mahonri Young at the Addison Gallery of American Art and at Kraushaar's; Milles at the Baltimore Museum of Art.

Nineteenth-century art was popular: The Age of Impressionism and Objective Realism was seen at the Detroit Institute of Arts; Eastman Johnson was revived at the Brooklyn museum. Notable 19th-century painters displayed by dealers included Four Great Impressionists and Hodler at Durand-Ruel's.

Among the old masters Jordaens was viewed at the Mortimer Brandt gallery; Poussin and Magnasco at Durlacher Brothers'. Exhibitions organized about a theme included Self-Portraits at the Schaeffer galleries; Ten Pictures in Search of an Author at Mortimer Brandt's; Origins of Modern Art at the Arts Club of Chicago; The Art of the Jeweler at the Metropolitan Museum of Art; The Animal Kingdom at the Morgan library; and Art, Genuine or Counterfeit, at the Fogg museum. The Albright Art gallery, Buffalo, surveyed the Architecture of Buffalo, 1816–1940; the Metropolitan Museum of Art compared Heads in Sculpture. Designs in Glass were seen at Steuben Glass, Inc., and Paintings of London and Paris at Knoedler's and Durand-Ruel's. (D. O.)

Art Galleries and Art Museums. The history of art museums and art galleries for 1940 is one of great contrasts: in Europe it was tragedy and a frantic attempt to save the priceless art treasures of the past from annihilation, while in the U.S. art interest greatly flourished. One-third of the population saw art in museums, community art centres and in both world's fairs, New York and San Francisco. Museums and dealers put on many different exhibitions, from Persian art, through the art of the Middle Ages, to the art of today, which proved the extent of the resources of art in the United States. The art of South America, Central America and Mexico received significant attention throughout the United States. The president proclaimed a National Art Week from Nov. 25 to Dec. 1, to assist artists throughout the country in selling their works. Two of the leading U.S. collectors gave their works to the people: Joseph P. Widener assigned his famous art collection to the nation, through the National Gallery of Art, in memory of his father, the late P. A. B. Widener; and Robert Woods Bliss gave his Dumbarton Oaks estate, land, library, art gallery and contents to Harvard university. In Europe, the art magazines of England carried on magnificently in spite of the war, keeping a steady stream of material printed about art, much as in normal times. The National gallery in London used its air raid shelter for concerts during lunch time; many other museums played a significant role in keeping open whenever possible. Both the British museum and the Tate gallery kept on buying works of art for their collections, in spite of having no place to show them, due to the evacuation of their collections and the bombing of the buildings. In Belgium, Holland and France contemporary art exhibits were on view at the time the nazis marched in and took possession.

JURY voting on paintings for the Cranbrook-*Life* exhibition at Bloomfield Hills, Mich., in May 1940. The exhibition was limited to living American artists

JOHN CARROLL'S PAINTINGS were the most successful display at the Detroit Art institute's exhibition in the spring of 1940. In the photograph are his "Moonlight" and "Ena"

The war in Europe so disturbed the world art situation that no one could say definitely in 1940 where masterpieces, loved by millions for centuries, were. According to some accounts the nazis took away the most important works of art from Poland to Germany, as they had from Austria before, to be sold through neutral countries to get foreign exchange for their war machine. The same thing may be true of works of art in Holland, Belgium and France. In Bermuda the British intercepted a shipment of 500 French paintings consigned to a dealer in New York.

Bronze monuments which had no historic or artistic value were melted up in Germany for war purposes. Hitler held a vast exhibit in Munich in the New Crystal palace of his own kind of art, intended to inspire his soldiers and people with a love of the nazi ideal of beauty. Spain, on the other hand, reopened the great Prado museum in Madrid, and it is interesting to note that, due to the great care and vigilance of the guardians of this famous collection, not one important masterpiece was lost during the war in Spain.

During 1940 the art world lost two important European artists: Paul Klee, the Swiss abstract painter, died on June 30 in Berne. Edouard Vuillard, the symbolist French painter, died at La Baule, France, on June 21.

English works of art and important architectural landmarks were damaged by air raids in September. The dome of St. Paul's and that of the University college in London and its library were reported bombed. The Tate gallery lost all its roof and window glass in bombings and the east wall and roof were damaged, but no works of art were hit; 4,000 objects were evacuated in six days; the director and his staff lived in the museum to guard the few objects being shown to the public, so art would not go completely dead despite the rain of death from the sky. The yard of the British museum was struck by a bomb and the glass shattered from the windows; damage to the Wallace Collection building was also reported. The important Gothic cathedral at Coventry was virtually destroyed by bombs. The work of British war artists commissioned by the government was exhibited under the auspices of the ministry of information. In Canada the Montreal Art association opened a new wing to display recent purchases.

The most progressive interest in art was shown in the United States of America during 1940. The New York world's fair showed an interesting exhibit of old-master paintings; works of art done under the Federal Art projects of the Work Projects administration; selections of contemporary U.S. art from each state; in addition to the foreign art exhibits at the fair. In San Francisco, during the fair, several important displays were held; an unusual exhibit of master paintings and drawings of six centuries; selections of contemporary U.S. art from each state and Europe; and art south of the Rio Grande, of Latin America and Mexico. One of the most popular attractions at this fair was "Art in Action," where well known artists worked in a public studio on their designs for painting, sculpture, murals and mosaics. The miniature rooms by Mrs. James Ward Thorne were great attractions at both fairs in 1939 and 1940; her new series of 37 American interiors in miniature, never shown before, were put on display at the Art Institute of Chicago in early December for a six-months period. The Metropolitan Museum of Art selected Francis Henry Taylor as its new director; this museum inaugurated a new lending policy, making available for museums, libraries, schools and colleges U.S. paintings since 1900 not needed for display, the recent accessions in the U.S. field going automatically on this lending list. The Rockefeller Educational grant provided means whereby five leading art museums could study methods to interest students in secondary schools in art: important new material will thus be made available. The University of Chicago and the Art Institute of Chicago were co-operating on a museum training course for advanced students. The members of the museum course of the Fogg Art museum, Harvard university, assembled an Exhibit of Art: Genuine or Counterfeit, in order to study fakes.

During 1940 a definite emphasis was placed upon American native art and culture and the artistic contribution of the United States was studied in many displays: The Carnegie Institute of Fine Arts showed 160 years of American painting, and Mrs. John D. Rockefeller, Jr., gave her collection of American Folk Art to Williamsburg, Va. The Philadelphia Museum of Art installed a new wing devoted to oriental art. A unique exhibition of French paintings since the Revolution, lent by French museums to South America, was shown in San Francisco, later going to the Metropolitan museum in New York and to the Art Institute of Chicago. Living artists in the U.S.A. participated in the commissions for new murals in public buildings under the treasury department of fine arts; and 82 community art centres throughout the country brought art to localities which had never enjoyed it before.

(L. B. Br.)

Arthritis. It has been estimated that about one in each 1,000 persons in the United States is affected with "rheumatism and allied diseases" on any one given day and that there were about 6,850,000 cases of "rheumatism" in the United States in 1937.

The spontaneous polyarthritis in the rats of Java, which was discovered several years ago, represents a disease closely similar to a common form of human arthritis. The rat disease has, however, been definitely traced to a pleuropneumonia-like organism. Sulphanilamide and its derivatives have been tried but have not proved generally effective. Some investigators have reported good results with gold preparations. Up to the present it does not seem that this spontaneous rat arthritis will elucidate the problems of arthritis in man as much as was originally anticipated. Continued studies of the immunology of arthritis have been made involving particularly the agglutination reaction. Thus Bunim and McEwen found that three-quarters of their patients with rheumatic polyarthritis showed an abnormally high agglutination titer (antistreptolysin) and those with other forms of joint diseases did not. This result cannot be interpreted as proof of a streptococcus causation, but the test has been described as helpful in diagnosis. Previous observations that the blood of patients with rheumatoid arthritis was abnormally low in vitamin C content have been confirmed and it has been demonstrated that such patients have a high tolerance for vitamin C. Even when administered in large quantities, however, no improvement could be attributed to the effect of the vitamin, perhaps indicating that this finding is an effect rather than a causative factor. No new important developments in treatment occurred in 1940. Colloidal sulphur, vaccine therapy, fever therapy and gold salts have received the greater amount of attention. Carefully controlled experiments on sulphur metabolism tend strongly to discourage the use of sulphur preparations for arthritis. Reports of the use of vaccines in general proved no more favourable than in preceding years. Fever therapy (the artificial production of high temperatures in the body) is not a new form of treatment but when carefully administered in selected cases sometimes gives encouraging results. Gold salts in the hands of some investigators appear to give favourable results, although the toxic effects may be serious and the exact types of arthritis in which they may be effective have not been defined. Pending further studies the use of gold salts must be considered dangerous and experimental and should be used only by experienced clinical investigators who are aware of all the possibilities.

More or less favourable results in the treatment of arthritis

have been reported from the use of activated ergosterol and of some oestrogenic substances. Some workers in the field have employed local anaesthetics by injection in order to control the intractable pain present in some forms of arthritis and related conditions. There is, however, a considerable difference in opinion as to the safety of this procedure and even more as to the durability of the relief of pain following local anaesthesia.

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Artillery: *see* ARMIES OF THE WORLD; EUROPEAN WAR; LIGHTNING WAR; TACTICS IN THE EUROPEAN WAR.

Art Institute of Chicago: *see* ART GALLERIES AND ART MUSEUMS.

Art Sales. The principal New York city auction gallery, Parke-Bernet, held 84 public sales of art and literary property during the 1940 season; it announced total sales amounting to $2,329,330. The Plaza Art galleries also held 84 sales during the season and reached a sales total of $1,008,564. Despite the European war, sales in nearly every case resulted in their estimated values and in some instances in excess of advance figures. The Clendenin J. Ryan collection, the most important print collection ever offered for public sale in the United States, was auctioned off by Parke-Bernet. Six masters were represented: Schongauer, Dürer, Van Dyck, Rembrandt, Meryon and Zorn. One of the most dramatic events in auction-room history took place when the famous set of 20 etched portraits by Van Dyck was up for sale, and $28,000 was offered for the lot. Then the auctioneer accepted bids on each portrait separately, and on this basis they were acquired by individuals in sharp competition for a total of $40,500. British 18th century paintings and sporting prints and 36 Gothic and Renaissance paintings were also included in the Ryan sale. Two bronzes from the collection entered American museums: the "St. Sebastian" by Alessandro Vittorio was acquired by the Metropolitan for $500; "Architecture," a female allegorical nude by Gian Bologna, was bought by Boston for $2,200. Another important sale was that of the Untermyer collection, when $18,000 was obtained for Rubens' "A Feast of the River Gods," and $11,750 for a Cellini bronze, "Jupiter." A rising market for Colonial and Middle American art was predicted. The best price ever paid for a Lincoln portrait was obtained for Thomas Hicks's "Lincoln," dated 1860, in the Mrs. Herbert Shipman collection. It was acquired by Kennedy and company for $11,000.

A National Art Week was created to stimulate art sales in the United States. In Washington, D.C., $9,621 worth of art was sold during the week; southern California reported a total of $7,772; Chicago, a total of $4,772; and Greater New York, $5,845.

England.—Surprisingly enough, London's auction season was lively, with prices holding up. At Sotheby's in May, the sale of the famous Eumorfopoulos collection of Chinese ceramics reached a total of £25,935, which exceeded the expectations of the experts. A Red Cross sale at Christie's in July brought £84,037.

(D. O.)

Asbestos. World production of asbestos increased to a new high record of over 600,000 metric tons in 1937, declined sharply in 1938, but rose again in 1939. Asbestos is largely of British origin, since 90% of the 1929 output and 77% of that of 1937 was mined in the British empire. In 1937 Canada supplied 61% of the world total, Southern Rhodesia 9%, South Africa 4% and Cyprus 2%; the only large producer outside the British empire was the soviet union, with 20% of the 1937 total, increased from 7% in 1929. The United States consumes about one-half of the world supply but has only a minor output, which, however, has increased nearly fourfold during the past few years, reaching 15,100 short tons in 1937. United States imports decreased from 307,200 short tons in 1937 to 179,500 tons in 1938, but rose to 242,600 tons in 1939. Preliminary estimates for 1940 indicate that Rhodesia will remain at about the 52,900 metric tons reported in 1939, Canada will show a small increase over 330,600 tons in 1939, while South Africa will have an increase of possibly one-quarter over the 20,000 tons in 1939. (G. A. Ro.)

ASCAP: *see* ADVERTISING: *Regulation and Ethics;* MUSIC, POPULAR; RADIO, INDUSTRIAL ASPECTS OF: *Musical Property.*

Ascension: *see* BRITISH WEST AFRICA.

Ashbrook, William Albert (1867–1940), U.S. representative in congress from the 17th Ohio district, credited with sponsoring more pension bills for soldiers than any other representative, was born on his father's farm at Johnstown, Ohio, July 1. After attending the public schools he worked in a printing office and at the age of 18 became the owner and editor of the *Johnstown Independent,* a weekly newspaper. Five years later he was appointed postmaster. He was a member of the Ohio legislature in 1905–06, but resigned when he was elected to congress, serving in that body for 20 years. At one time he was the only Democrat in the Ohio delegation. He served four years as secretary of the National Editorial Association. He died at Johnstown, Jan. 1.

Asia: *see* AFGHANISTAN; CHINA; INDIA, ETC.

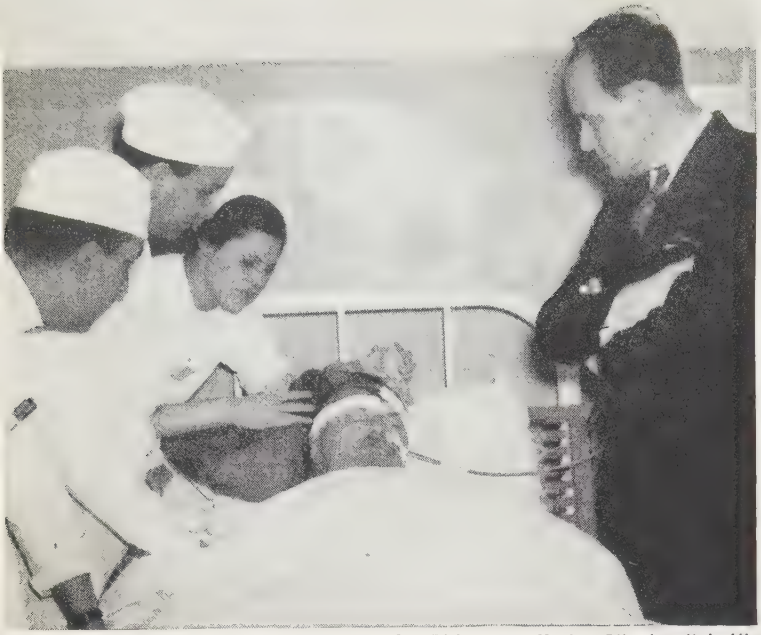
Asphalt. More than half of the world supply of native asphalt comes from the famous asphalt lake of Trinidad; the bulk of the remainder is divided between Egypt and the United States, with possibly 10% distributed among several minor producers. A number of countries, with the United States in the lead, produce considerable quantities of asphaltic or bituminous rock, carrying usually less than 10% of true asphalt. The largest item, however, is petroleum asphalt, of which there was produced in the United States in 1939 some 5,988,000 short tons, 78% from domestic petroleum, and 22% from foreign. As compared with this, the domestic production of bituminous rock was 422,500 tons, and native asphalts only 37,400 tons. Production in Trinidad declined from 219,600 long tons in 1929 to 92,800 tons in 1934, recovered to 145,900 tons in 1937 and was 130,300 tons in 1939. (G. A. Ro.)

Assassinations. The assassinations of 1940, actual or attempted, included the following:

Jan. 22 Baghdad, Iraq. Seyyid Rustum Haidar, minister of finance, who was shot by a dismissed police inspector Jan. 18, died of his wounds.

March 1 Havana, Cuba. Orestes Ferrara, former sec'y of state, was shot and dangerously wounded by unknown assailants.

March 13 London. Sir Michael O'Dwyer, retired Indian administrator, was fatally shot by Mahomed Singh Azad, an East Indian, at a public meeting. Azad also wounded Lord Zetland, sec'y of state for India, Sir Louis Dane and Lord Lamington, both former British administrators in India.



DEATHBED of Lev Trotsky, Aug. 21, 1940, in a Mexico City hospital. His assassin, according to Trotsky's associates, was an agent of the Russian OGPU

April 5 London. Judge Edwin Cooper Burgis, chairman of the British tribunal for conscientious objectors, was seriously wounded by an assailant who stabbed him six times in the back.

July 19 Shanghai. Samuel H. Chang, director of the U.S.-owned *Post Mercury* company and two Chinese newspapers, was assassinated by a gunman in the International settlement.

Aug. 20 Mexico City. Lev Davidovich (Leon) Trotsky, Russian politician who fled from Russia and ultimately took refuge in Mexico, was fatally attacked by a man whom he described as an agent of the Russian OGPU. The assassin gave his name as Frank Jackson but was identified as Jacques M. van den Dreschd. Trotsky died of his injuries the next day. A previous attempt to assassinate him had been made May 24.

Sept. 7 Timisoara, Rumania. An attempt was made to assassinate ex-King Carol of Rumania as he was fleeing by train from Bucharest to Switzerland.

Oct. 11 Shanghai. Fu Hsiao-en, Japan's puppet mayor of the city, was assassinated while asleep in his home.

Nov. 27 Rumania. Members of the Iron Guard broke into the Jihlava military prison and killed 64 former high officials who had served under ex-King Carol.

Nov. 28 Bucharest, Rumania. Nicolas Jorga, former premier of Rumania, was assassinated as the Iron Guard continued the "purge" of its enemies.

Nov. 28 Havana, Cuba. Raul Fernandez Fiallo, professor in the University of Havana, was assassinated by unidentified assailants near the university grounds.

Association for the Advancement of Science, American: *see* AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Asthma: *see* ALLERGY.

Astronomy. Two new instruments, a 24-inch reflector and a 70-foot tower telescope, were placed in operation at the McMath-Hulbert observatory during 1940. The addition of these new instruments makes possible the simultaneous observation of solar prominence motions in three dimensions and measurements of the energy output involved. These additional facilities and unique observational techniques already developed at this observatory place it in the front rank of the world's solar observatories.

A new high-altitude station for solar observation was established in Colorado by the Harvard college observatory. This new station is equipped with a coronagraph of design similar to that devised by Lyot and the altitude of over 11,000 feet should provide the observers with exceptionally fine atmospheric conditions.

Solar System.—*The Sun.*—Among the data needed for an understanding of the physical conditions existing in the sun is an accurate determination of the solar spectral-energy curve. Using a double quartz monochromator, Pettit has investigated the spectral-energy curve in the ultraviolet. After allowing for the effect of the earth's atmosphere and for the absorption of the Fraunhofer lines, as far as that was possible, he found the resulting observed energy curve to be quite different from that of an ideal black body. The very great difficulty of allowing adequately for the effects of the absorption lines, due to insufficient resolution, probably accounts for much of the discrepancy.

Areal and photometric observations of solar eruptions made by Giovanelli at the Commonwealth Solar observatory show that approximately 20% of these eruptions eject eruptive prominences. Giovanelli suggests the hypothesis that the constant velocities of these prominences, first pointed out by Pettit, are maintained by radiation pressure of the Lyman alpha line of hydrogen and that the changes of velocity may originate in magnetic fields.

Planetary System.—Of the five comets discovered during 1940, two were previously known periodic comets which were rediscovered, whereas the remaining three were new objects. The most interesting of these was discovered by Cunningham on plates taken at the Harvard observatory. Comet Cunningham reached naked-eye brightness during the last month of the year before disappearing from the view of northern observers.

Observations of meteors at various times of year showed indication of a seasonal variation in height. Using data from all available published real paths of meteors, exclusive of shower meteors, McIntosh showed that there exists a well marked seasonal variation in height for the sporadic meteors. He found the amplitude of variation to be greatest at the lower levels in the atmosphere, and also that a similar seasonal variation exists in the width of the meteor zone. These results indicate that the cause of the variation in height lies in the atmosphere itself, the greater height occurring in summer due to heating and expansion of the atmosphere.

The question whether fireballs have been members of our solar system or have come from interstellar space is of importance to astronomers. A study by Wylie of the Pultusk fall of meteorites of Jan. 30, 1868, is of particular interest in this connection. Galle, the discoverer of Neptune, published a rather extensive discussion of the orbit of this meteorite in 1868 and concluded that the velocity was hyperbolic, *i.e.*, that the meteorite came from interstellar space. Wylie's study indicated that with one exception Galle's figures for this meteor should be approximately correct. The exception is that the adopted height of appearance of the meteor is far too great. Modern measures indicate that, even for fireballs which vary greatly in size and brightness, there is little variation in the height of appearance. Investigations by Wylie and by Watson indicated a tendency for astronomers to place the height of appearance of a meteor far too high when depending solely on reports of the general public. Wylie adopted a height of appearance for the Pultusk meteor based on modern measures and found that when this was done the meteor proved to be a regular member of our solar system. The new orbit shows a semi-major axis one and three-quarters that of the earth's orbit, an eccentricity of 0·45 and a period of 2·37 years. It

would appear that the number of meteors having hyperbolic velocities may not be nearly as large as previously predicted by Opik and others.

The possibility of the existence of formaldehyde gas in the atmosphere of Venus was investigated by Wildt. Ultraviolet spectrograms of Venus show no trace of formaldehyde bands. Nevertheless Wildt suggested that a tenuous primordial atmosphere of water vapour and carbon dioxide would afford suitable conditions for the photochemical synthesis of formaldehyde. In a moist atmosphere formaldehyde, (CH_2O), would rapidly polymerize into a mixture of polyoxymethylene hydrates, $(CH_2O)_x \cdot H_2O$, which is a white crystalline solid. Wildt suggested that, since the atmosphere is free from water vapour, the very dense clouds observed may be constituted of solid polyoxymethylene hydrates. This conclusion is of particular interest in view of the suggestion of observers at the Lowell observatory that the brightness of the halo about Venus, when it is nearly between us and the sun, could be caused by scattered "dust" particles in the planetary atmosphere.

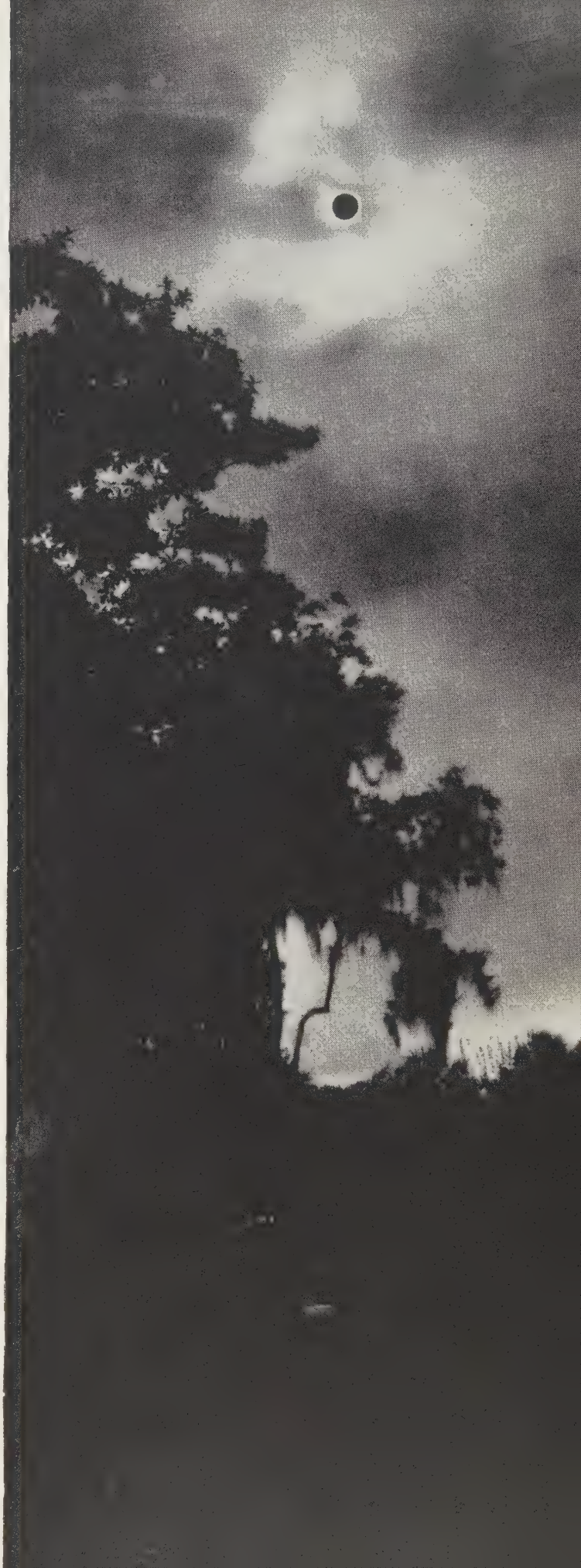
Recent measurements of the total radiation emitted by gaseous carbon dioxide have been made by Dreisch and by Eckert. Using these measures, Wildt calculated the upper limit to the greenhouse effect produced by the carbon dioxide in the atmosphere of Venus. He concluded that the temperature of the sub-solar point is between 93°C. and 135°C., and probably nearer the higher value. It appears, at least, that the surface temperature of Venus is somewhat above the terrestrial boiling point of water.

New radiation measurements of the eclipsed moon were made by Pettit with a 20-inch telescope of 40 inches focal length. Both a cover glass and a water cell were used to determine temperature. For a point near the centre of the disk the temperature dropped from 371°K. to 200°K. during the partial phase and then slowly dropped to 175°K. during totality. The rate of radiation was observed to be nearly proportional to the energy received except at the lowest temperatures. Pettit found that an equivalent thickness of the radiating layer of approximately one inch will satisfy the conditions, which means that the moon's surface must be covered by some loose agglomerate such as pumice or volcanic ash.

It has long been known that the brightness of Eros varied in a period of about five hours. Jones made a thorough investigation of the possibility of short-period variations in the orbital path, based on a large number of observations from various observatories. Contrary to the conclusions of Vick, reached from a study of very limited data, Jones found no evidence whatever of such short-period variations in the position of Eros and concludes that this interesting asteroid is an entirely suitable object for the determination of the solar parallax.

Stars.—*Special Stars and Stellar Structures.*—Differences of colour among stars of a given spectral type have long been puzzling and have been attributed either to differential absorption in space or to the effect of luminosity. If attention be confined to stars which are at the same distance and in the same direction, for example those in galactic clusters, the effect of differential absorption can be eliminated. Such an investigation was undertaken by Hunter and Martin, who found that the dispersion of colour in any one spectral type is greater than can be explained by observational error and hence is of physical origin. They found, however, no significant correlation between this dispersion and luminosity.

Stars of a close binary system, such as short-period eclipsing stars, are known to have a more or less ellipsoidal figure. It has been pointed out by Takeda, Chandrasekhar and others that



FULL ANNULAR ECLIPSE of sun at 5:07 P.M., April 7, 1940, photographed at Green Cove Springs, Fla., by D. Franklyn Yerex

these elongated stars must have an unequal distribution of light over their surfaces due to a gravity effect. A preliminary investigation of the effect of this unequal distribution on light-curves of eclipsing pairs was made by Sitterly, who found that the effect is readily observable for very close pairs and will occasion alteration of the photometric elements. This unequal distribution of brightness over the star's surface might also be expected to affect spectroscopic observations of such a close pair. Indeed Sterne found that if allowance is made for such distribution of brightness the anomalous eccentricities obtained from spectrographic observations are explained and complete agreement between spectrographic and photometric results is obtained.

New evidence from laboratory experiments concerning the carbon cycle which Bethe proposed as a source of stellar energy provided improved estimates of the probabilities of the related nuclear reactions. Bethe concluded that the lifetimes of C^{12} and N^{14} are almost equal and hence that C^{12} and N^{14} should be about equally abundant in stars of the main sequence, which agrees with astrophysical evidence. The total time necessary to complete the cycle is estimated to be 6×10^6 years, so that a combined abundance of C and N only one-tenth that previously assumed will produce the same energy evolution. This value is in better agreement with astrophysical data.

An exceedingly extensive investigation of the masses of the stars by Russell and Miss Moore was published during 1940. All visual, spectroscopic and eclipsing binaries for which sufficient observational data are available have been included in this study. One of the principal results of this investigation is the conclusion that a simple linear relation between masses and luminosities of stars is of very general application.

A catalogue of new dynamical parallaxes of 2,529 stars results from the investigation.

Stellar System.—Contributions to systematic astronomy include the eleventh list of trigonometric parallaxes determined at the Cape of Good Hope and the parallaxes of 26 stars by van Maanen. Systematic and accidental errors of spectroscopic parallaxes were investigated by Russell and Miss Moore. Deviations from linear correlation between mean reduced spectroscopic and trigonometric parallaxes of 1,140 stars were found to be no larger than could be attributed to accidental and sampling errors. The authors concluded that differences in the relative abundance of hydrogen and heavy elements, and differences in the contribution of negative ions to general opacity account for most of the apparent errors of spectroscopic parallaxes. After appropriate corrections are applied, the probable error of a corrected spectroscopic parallax is found to be $\pm 21\%$ for stars of the main sequence and $\pm 16\%$ for giants.

From a study of selective absorption based on the colours of 1,332 B-type stars observed with a photoelectric photometer, Stebbins, Huffer and Whitford found a median value for the absorption coefficient in photographic light of 1·1 magnitudes per kiloparsec. Their study showed clearly, however, that in the first 2,000 parsecs from the sun the absorption of interstellar material near the galactic plane is much too irregular to be adequately represented by a mean absorption coefficient.

External Galaxies.—Among the numerous studies of spiral nebulae during the past few years little has been done on the colour of these objects. Of particular interest, therefore, are observations of seven spiral nebulae by Seyfert with red- and blue-sensitive plates. He found that these nebulae seem to have a general background intensity which decreases uniformly outward from the nucleus and has the same colour. The spiral arms, however, and the nebulous condensations in them have a red index of 0·0 magnitude, thus making them considerably bluer than the nucleus. (*See* also TELESCOPES.)

BIBLIOGRAPHY.—H. N. Russell and C. E. Moore, *The Masses of the Stars* (1940); P. W. Merrill, *Spectra of Long-Period Variable Stars* (1940); G. Strömberg, *The Soul of the Universe* (1940).

(N. L. P.)

Athletics: *see* TRACK AND FIELD SPORTS; etc.

Athlone, 1st Earl of (ALEXANDER AUGUSTUS FREDERICK WILLIAM ALFRED GEORGE CAMBRIDGE) (1874–), British statesman, was born April 14 at Kensington palace, the third son of the 1st duke of Teck. Educated at Eton and the royal military college, Sandhurst, he served in Matabeleland, Southern Rhodesia, in 1896 and saw action during the Boer war, receiving the Queen's medal with five clasps. During the World War of 1914–18 he was mentioned twice in dispatches, and in 1917 he was created 1st earl of Athlone. He was governor general of the Union of South Africa from 1923 to 1931. In 1931 he was made governor of Windsor castle, in 1932 chancellor of London university and in 1936 grand master of the Order of St. Michael and St. George. In the latter year he was also appointed personal aide-de-camp to the king.

He was appointed 16th governor general of Canada April 3, 1940, to succeed the late Lord Tweedsmuir (*q.v.*). Arriving in Halifax June 19, he was inducted two days later. On July 17, in his first public address as governor general, he pleaded for unity throughout the British empire. An important diplomatic event of his first year in Canada was his visit with his wife, Princess Alice, and official family to President Roosevelt at Hyde Park in October.

Atom: *see* CHEMISTRY; MATTER, STRUCTURE OF; PHYSICS.
Audiometer: *see* DEAFNESS.

Australia, Commonwealth of, a self-governing member of the British commonwealth of nations, situated in the southern hemisphere between longitudes 113°9′ E. and 153°39′ E. and latitudes 10°41′ S. and 43°39′ S.; national flag, a blue ensign, with the Union flag in the quarter and six white stars in the field. Ruler, King George VI; governor general, the Rt. Hon. Lord Gowrie, V.C.; premier, R. G. Menzies; language, English; religion, Christian (census 1933: Anglican, 2,565,118; Roman Catholic, 1,161,455; Presbyterian, 713,229; Methodist 684,022; other Christians, 603,914).

Area and Population.—Area, 2,974,581 sq.mi.; population (est. Dec. 31, 1939), 6,997,326. Chief towns (pop. Dec. 31, 1939): Sydney (1,302,890), Melbourne (1,046,750), Adelaide (322,990), Brisbane (326,000), Perth (224,800), Hobart (65,450), Newcastle (115,660). Capital, Canberra.

History.—R. G. Menzies continued at the head of a minority government composed exclusively of members of the United Australia party until March 1940. In spite of the determination of all parties to support measures for the vigorous prosecution of the war, the task of the government was not an easy one. The defeat of the government candidate at the by-election, occasioned by the resignation of R. G. Casey to take up his appointment as Australian minister to Washington, added to their embarrassment. Negotiations between the prime minister and A. G. Cameron, leader of the Country party, resulted in the formation on March 14 of a coalition government in which the Country party received three portfolios and two assistant ministerial posts.

On June 25 the house of representatives passed the National Security bill by 60 votes to 10, and on the following day it passed through all the stages in the senate. The principal provision of this act empowers the governor general to make regulations which require persons to place themselves, their services and their property at the disposal of the commonwealth, as appear to him to be necessary or expedient for securing the public safety,

the defence of the commonwealth or the efficient prosecution of any war in which the king is, or may be, engaged. The only limitation on the powers conferred by the act is that no regulation may be made which will authorize any form of compulsory service beyond the limits of Australia and its territories.

In July Mr. Menzies offered the opposition five or possibly six seats in the cabinet if a national government were formed. He also announced that the cabinet would ask powers to extend, if necessary, its term of office which was due to expire on Nov. 28. To give parliament the powers proposed, a resolution would have to be passed by both houses of the federal parliament and be confirmed by legislation through both houses of the British parliament. Neither of these proposals was acceptable to the Labour party and the prime minister decided that the federal election should be held on Sept. 21. A bill was passed to enable the Australian fighting forces overseas to vote.

The result of the general election was that the government majority was reduced to one in the house of representatives and two in the senate. Negotiations for the formation of a national government again failed, but labour agreed to the establishment of a war council composed of four members of the government and four members of the labour opposition with the prime minister as chairman.

Brigadier Street, minister for the army; Sir Henry Gullett, vice-president of the executive council; J. V. Fairbairn, minister for air; General Sir Brudenel White, chief of the Australian general staff and six others were killed when the plane in which they were travelling to Canberra crashed within a mile of its destination on Aug. 13.

The census which should have been held on June 30 was postponed in consequence of the war.

External Affairs.—Australian representation abroad was strengthened during 1940 by the appointment of R. G. Casey as minister to Washington and Sir John Greig Latham as minister to Tokyo. Sir Thomas William Glasgow was appointed high commissioner to Canada.

Sir Walter Massy-Greene led the Australian delegation to the eastern group conference which met on Oct. 25 at Delhi to consider production and supply questions associated with the empire's war effort.

War Measures.—In addition to the ships of the royal Australian navy in commission at the outbreak of war, five ships were armed as merchant cruisers, 30 as war auxiliary vessels and more than 150 merchant ships were defensively equipped. An intensive program of naval construction within the commonwealth was planned and two vessels were completed. A further ten vessels were in course of construction, including destroyers and patrol vessels. A widespread system of organization was developed for the provision of fuel and stores at strategic points. Victualling stores for the use of the royal navy, the Australian Imperial force abroad and the Indian army were sent overseas. Little detailed information of the work of the navy was likely to be revealed until after the war, but the admiralty announced that H.M.A.S. "Sydney" sank the modern Italian cruiser "Bartolomeo Colleoni" by gunfire during an action in the Mediterranean and that an Australian destroyer had sunk an Italian submarine, also in the Mediterranean.

The policy of the government was that no limit should be set as to the number of volunteers for overseas service with the Australian Imperial force. The speed at which such recruits could be accepted must be governed by the output of modern military equipment and the facilities which could be provided for their training. These factors had to be considered in conjunction with the organization of an adequate force for home defence. By June 30, 22 A.I.F. camps and 36 militia camps had been established. The strength of the A.I.F. was 89,556; the permanent military forces 18,398; and the militia 76,230. Part of the A.I.F. had been sent overseas and this force was to be increased to a complete corps of four divisions. A home defence volunteer force of 30,000 was being trained and further drafts of universal trainees were to be called up under a plan which provided that a land force of 250,000 should be maintained in Australia for home defence.

One squadron of the royal Australian air force was attached to the coastal command in the United Kingdom and three squadrons were serving overseas in the far east. Under the development program the number of military aircraft in Australia was doubled and a corresponding increase in personnel had taken place.

Australia is one of four partners in the Empire air training scheme. The organization necessary for the production of the number of air crews fixed as Australia's quota under the agreement made at Ottawa was ahead of schedule. Training establishments to be formed or reorganized to meet the requirements of this scheme consisted of 13 elementary training schools; eight service flying schools; three initial training schools; four air observers' schools; four wireless air gunners' schools; four bombing and gunnery schools; and three air navigation schools. The number of volunteers for the R.A.A.F. and the empire scheme totalled 132,000, of whom 32,000 had been accepted.

A ministry of munitions was set up with Mr. Menzies as the minister in charge. The direction of the new department was entrusted to a panel of industrial and business executives of outstanding ability with Essington Lewis as director-general. By June 25 new munition annexes had been established, most of which were in production before the end of 1940. The total number of employees engaged in munition production at government factories and munition annexes was 15,200 and it was planned that a further 65,000 would be engaged within 12 months, in addition to about 70,000 men who would be working on the production of materials for munitions making.

Public Finance and Economic Affairs.—Federal revenue for 1939–40 amounted to £111,913,421 and the excess of receipts over expenditure was £2,928,566 after charging an additional £9,000,000 for defence purposes against revenue. Total defence and war expenditure for the year was £55,200,000 of which £24,300,000 was charged against revenue and the balance of £30,900,000 against other funds, including loans. The excess of receipts was appropriated for war purposes.

The outbreak of war in 1939 occurred when Australia was experiencing a mild recession. As a result of a long period of falling prices, business activity had declined. Investment had fallen away, the liquidity of the banks was very low and the state of London funds was causing anxiety. When, in Nov. 1939, Mr. Spender, the acting treasurer, introduced the first post-war supplementary financial statement dealing chiefly with the proposals for increased war expenditure, the government policy was to postpone full wartime taxation until the economic position had improved to the desired degree.

As a consequence of this policy employment rose steadily during the early months of 1940, and labour was absorbed in war industries without robbing other productive activities of their finance or their labour. At the same time favourable conditions in the primary industries resulted in a large increase in volume of export productions and export prices rose by about 20% above the level of the previous export season. National income rose and it is officially estimated that for the year 1939–40 the total national income was £866,000,000 or nearly £100,000,000 greater than the previous record established in 1929. The liquidity of the banking system improved and interest rates on all classes of securities showed a downward tendency.

On May 2 the treasurer, Mr. Spender, laid before the house his taxation proposals for the fiscal year 1940–41. This action was

unprecedented in the financial history of the commonwealth, for two months of the current fiscal year 1939–40 had yet to run. He announced that the commonwealth's economic and financial position had improved to such an extent that it was expedient to shift the emphasis of the government's financial program away from borrowing from the banking system and throw it substantially on to taxation and loans from the market. It was estimated that war expenditure within the commonwealth would be £79,000,000 in 1940–41 and that existing taxation would yield only £16,000,000. Under the current program a further £7,000,000 had to be found for the fiscal year 1939–40. This meant that a total of £70,000,000 additional funds had to be raised and he proposed that £20,000,000 should be provided by additional taxation and that £50,000,000 should be raised by public borrowing in Australia. Taxation was increased over a wide field, £10,300,000 by indirect and £9,700,000 by direct taxes. The total war expenditure in Australia and overseas was estimated at £110,000,000 and of this sum the budget provided a contribution of £36,000,000 or approximately one-third.

Since these financial proposals were laid before the house, progressive revisions of the war program entailed increased financial commitments and the revised estimate of war expenditure for the fiscal year 1940–41 amounted to £177,000,000—£145,000,000 within the commonwealth and £32,000,000 to be spent overseas.

The first war loan of £18,000,000 in February was fully subscribed and a further loan of £20,000,000 offered to the public in June was oversubscribed.

War savings certificates were placed on sale on March 18, and it was hoped that the public would subscribe £10,000,000 by the end of the year; by mid-October £14,000,000 worth of certificates had been sold.

Overseas trading statistics for 1939–40 record that imports and exports of merchandise practically balanced, the respective totals being £144,900,000 and £145,600,000. Information regarding movement of gold was not published, but it was estimated that production during 1940 was in the vicinity of £17,500,000. The service of government and semi-government debts overseas cost about £28,000,000, leaving a deficiency of £10,000,000 on "visible" items which was to be met by capital movements or by a depletion of London funds.

Education.—In 1937: state schools, 10,205; average attendance, 768,848; private schools, 1,880; average attendance, 210,101; technical education, net enrolments, 102,496; business colleges, average attendance, 21,139; universities, number of students, 11,098. (*See* also EDUCATION: *British Empire.*)

Banking and Finance.—Revenue (actual 1939–40), £A111,914,000; (est. 1940–41) £A150,100,000; expenditure (actual 1939–40), £A108,986,000; ordinary (est. 1940–41), £A95,073,000; defence, £A65,000,000; public debt (June 30, 1940), £A1,321,793,028; notes issued (June 24, 1940), £A60,875,000; gold and sterling reserve (June 24, 1940), £A16,082,000; exchange rate, £A125 = £100 sterling.

Trade and Communication.—Overseas trade 1939–40 (merchandise): imports, £A144,921,000; exports, £A145,589,000; (bullion and specie 1938–39): imports, £A3,562,000; exports, £A18,963,000. Communications and transport: 1939, roads, total mileage, *c.* 500,000; metalled, *c.* 200,000mi.; railways open to traffic, 27,961mi.; airways (1938–39), distance flown, 14,098,615 mi.; passengers carried, 147,919; goods carried, 1,734,644lb.; mails carried, 740,375lb.; shipping with cargo and in ballast, in net tons, entered (monthly average 1938–39), 558,000; (monthly average 1939–40), 508,000; cleared (monthly average 1938–39), 553,000; (monthly average 1939–40) 502,000; motor vehicle registrations (Aug. 31, 1940): cars, 557,780; commercial vehicles, 263,404; cycles, 74,445; wireless receiving set licences, 1,212,260; telephones, number of lines, 506,612.

Agriculture, Manufactures, Mineral Production.—Production (in metric tons): wheat (1939–40), 5,719,600; gold (1939), 51,187 kilograms; wool (1939), 446,100; cane sugar (1939–40), 943,000; coal (1939), 12,438,000; lignite (1939), 3,720,000; iron ore (metal content) (1938), 2,287,000; pig iron and ferro-alloys (1938), 945,000; wine (1938–39), 680,000 hectolitres; oats (1938–39), 282,000; barley (1938–39), 245,000; maize (1938–39), 179,000; potatoes (1938–39), 278,000; butter (1938–39), 206,800; lead (smelter production) (1939), 185,000; zinc (smelter production) (1938), 70,000; copper (smelter production) (1938), 17,400; tungsten ore (1938), 540; antimony ore (1938), 900; silver (1939), 385. Labour and employment: employment in factories (1928–29 = 100) Aug. 1940, 120·2; number (average Aug. 1940), 562,500; unemployment, Trade Union returns (May 1940), 10·5%; recorded material production (1938–39), £A464,993,000. (W. D. MA.)

Australia, South: *see* SOUTH AUSTRALIA.

Autobiography: *see* AMERICAN LITERATURE; ENGLISH LITERATURE.

Automobile: *see* MOTOR VEHICLES; MOTOR TRANSPORTATION.

Automobile Accidents: *see* DISASTERS; INSURANCE, AUTOMOBILE; MOTOR VEHICLES; TRAFFIC ACCIDENTS.

Automobile Racing.

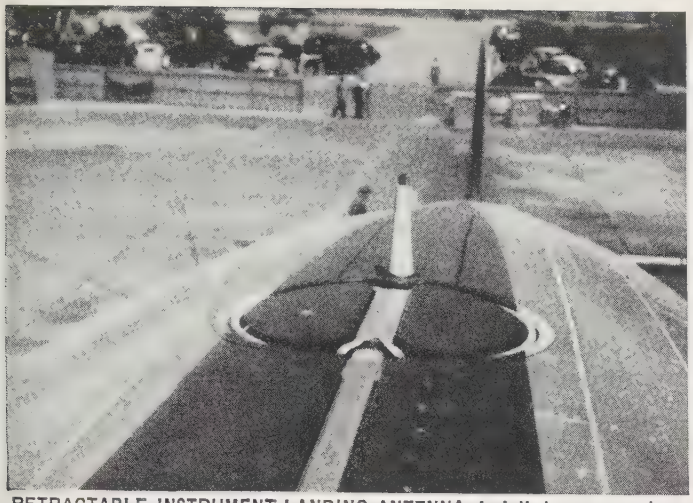
The victory of Wilbur Shaw in the annual 500-mi. Indianapolis auto racing classic on Memorial day transcended in importance all other features of the speed kings during 1940. Shaw became the first man in the 28 year history of the event to win two years in succession.

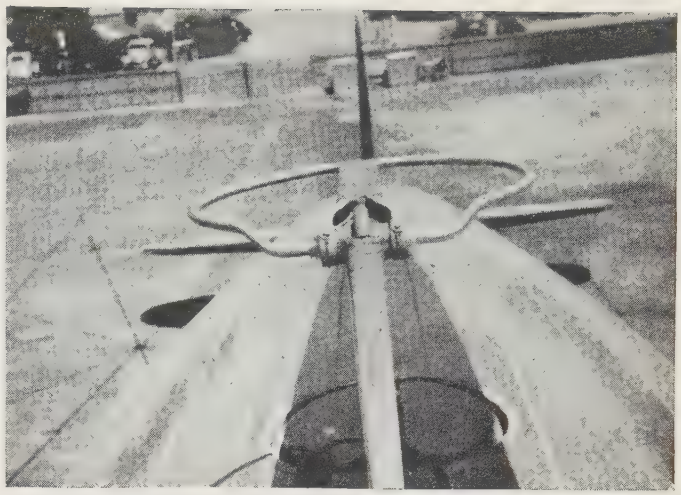
Competing before 142,000 spectators, Shaw completed the distance in 4 hr. 22 min. 31·16 sec. But his average of 114·277 m.p.h., resulting in a large degree from the decreased pace ordered at the 375-mi. mark, was considerably below the record figure of 117·200 m.p.h. of the late Floyd Roberts in 1938.

Rex Mays, who finished two and a half miles behind Shaw, was the runner-up, with third place being annexed by Mauri Rose of Columbus, O. The 825 tallies thus credited to Mays helped the Californian capture the American Automobile association national point championship for 1940. Victories later in the campaign at Springfield, Ill. and Syracuse, N.Y., boosted his total to 1,225. In the point tabulation, Shaw took second place, having received 1,000 points for his Memorial day triumph. Rose took third in standing with 675, Ted Horn of Hawthorne, N.J., fourth with 625. Late in July 1940, Ab Jenkins, six-foot mayor of Salt Lake City, participated in a 24-hr. endurance race on the Bonneville salt flats in Utah. He broke 21 world marks while completing his sweep of all the land speed records from 50km. to 3,000mi. and from 1 hour to 24. The car thundered a total of 3,868.32mi. over the saline race courses and averaged 161·18 m.p.h. for the entire period. This was nearly four miles faster than the world standard of 151·27mi. Jenkins had set in 1939.

Leading virtually from start to finish, George C. Rand of New York won the second annual Montauk (L.I.) Grand Prix road race.

Midget Automobile Racing.—One of 1940's high lights was the 100-mi. national A.A.A. title event at Langhorne, Pa. The winner was Joe Garson of Great Neck, N.Y., who led Chet Gibbons of Paterson, N.J., by a quarter of a mile at the finish. Garson ranked fourth in the season's final point standing of drivers on the eastern midget racing loop. He was credited with 2,923 tallies on the list announced by the A.A.A. contest board. The roster was headed by Charles Miller of Linden, N.J., with 4,497½. (T. J. D.)





RETRACTABLE INSTRUMENT LANDING ANTENNA, installed on many planes in 1940. Photograph at left shows antenna retracted; at right, in position for landing. This device decreases wind resistance and prevents formation of ice on the antenna

Aviation, Civil. In a world at war, civil aviation must be content with second place. In nearly every country, even those not in the war, military activities dominated the aviation scene in 1940. In the European countries at war, private flying ceased altogether. The only civil aviation carried on in Europe, as well as in China and Japan, was that of government-subsidized air lines.

Transport.—On the outbreak of the war in the fall of 1939, all commercial air lines in Europe discontinued their service outside their own boundaries, but within a short time adjustments had been made to war conditions and many international routes were being flown as before. Until the fall of France, service between London and Paris was continued by British Overseas airways and Air France. Middle Europe was connected by nearly a dozen air lines. The British air line and the Dutch-owned K.L.M. system continued to fly their international routes to the far east. When the Germans occupied Holland and France, both Air France and K.L.M. services operating from continental bases were disbanded. Both lines lost valuable equipment to the Germans.

By the fall of 1940, a number of schedules were being flown regularly. Most active line was the German Deutsche Lufthansa, which was flying from Berlin to Oslo, Stockholm, Moscow, Lisbon, Rome, Bucharest and many German cities. Air lines from Russia, Hungary, Italy, Spain, Sweden, Denmark, Finland, Portugal and Switzerland were in operation. The British Overseas Airways was flying regularly to Lisbon, which airport was fast becoming the most famous international transfer spot in the world as British, Italian, Swiss and German lines flew there to transfer passengers to Pan American's Atlantic service.

K.L.M.'s services in the West Indies and that of its associated company in the Dutch East Indies were continued.

Most aggressive, as well as most spectacular, air line in international transport circles was Pan American airways. Flying more than 69,564 mi. of routes and connecting some 53 countries and colonies, this line reached an all-time high in volume of business in 1940. Its ships flew 17,000,000 mi. and carried 275,000 revenue passengers a total of 140,000,000 mi. In 1939, it had established the first passenger service by aeroplane across the Atlantic. With the coming of war in Europe, demand for air transportation reached such a point that more passengers were rejected than could be accepted, due to lack of facilities. Flying three Boeing "clippers"—huge flying boats—the air line provided three round-trips weekly between New York and Lisbon. Because of its speed and dependability, this route became the most important means for carrying both U.S. government personnel and documents to and from Europe. By the end of 1940, nearly 300 crossings had been made. Plans for 1941 include a change of routes. Instead of stopping at Horta where the harbour is not protected from rough seas, P.A.A. plans to fly nonstop to Lisbon from New York. The return trip will be down the west coast of Africa to Bolama in Portuguese Guinea, then to Port of Spain, Trinidad, and up to Puerto Rico and New York. While much farther, this route takes advantage of favourable winds and more than double the number of passengers can be carried. Additional clippers will be added in 1941.

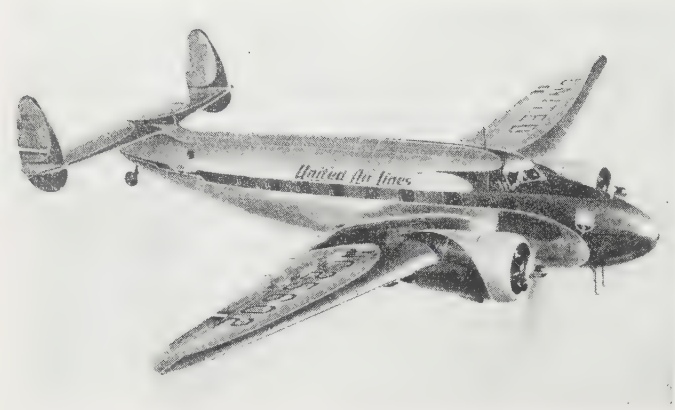
In the Pacific the regular schedules were maintained from the U.S. to Hawaii, the Philippines and China. In addition, a new passenger route to New Zealand was inaugurated. This 8,000-mi. extension saves much time over steamship schedules. Another new route established by P.A.A. was from Seattle to Juneau, Alaska. This line has considerable military value because of the increasing strategic importance of Alaska and the establishment of both army and navy bases there.

Pan American airways service from the U.S. to South America was increased as much as 50% during 1940. Schedules from Miami to Rio de Janeiro were cut two days when a new cutoff was established between Belem, Pará and Rio. Pressurized Boeing "Strato-Clippers" are used which fly directly between these two cities, rather than follow the bulging coast line.

Another air line, American Export, a subsidiary of the steamship line, entered the international picture when it was approved to fly to Lisbon. It expects to begin its Atlantic service in 1941. This line also entered the Central American sphere when it purchased the highly successful TACA air line, which operates through five Central American countries.

U.S. Transport.—Air lines within the United States had their most prosperous year to date in 1940. Every line found itself with increased passengers, mail and air express. Many new aeroplanes were purchased and additional territory was added to existing routes. Although 1939 had been a banner year, traffic in 1940 was from 50% to 75% better than in each month during the previous year. The number of revenue passengers was more than 2,700,000 for the 12 months, compared with 1,703,300 for 1939. Profits for the first nine months of 1940 were 78% better than for a similar period in 1939. Total value of air express was over $3,000,000 compared with $2,385,000 in 1939.

At the end of 1940, the greatest problem of the air lines was not how to get more passengers but rather how to get aeroplanes in which to carry them. The air lines had approximately 350 aeroplanes in service. Due to the rapid expansion in 1939 and 1940 and expanded routes planned for the future, some 435 additional



FOUR LOCKHEED LODESTARS, reputedly the fastest transport planes in the world, began passenger service in 1940

planes had been ordered, largely from two manufacturers: Douglas and Lockheed, although a half-dozen were on order from Boeing. Claiming that both the aeroplanes and engines could be put to better use in the army air corps, the priorities board of the national defence commission restricted the sale of a large share of the equipment ordered by the air lines. The air lines expect to receive some of the aeroplanes they have ordered but the proportion had not been set by the end of the year. Among the ships whose delivery will be delayed are the four-engined Douglas DC-4s, that will carry twice as many passengers as the DC-3s, in 1940 standard equipment on most of the large air lines. Air lines had hoped to get the first of these large ships in the spring of 1941 but it is problematical if any will be completed before 1942. Delays in getting equipment will definitely be a handicap to domestic air lines.

Private Flying.—The greatest expansion in private flying in the history of American aviation took place in 1940. Under the auspices of the government's civilian pilot training program some 50,000 flight students were given instruction during 1940 in 700 training centres, and several thousand additional pilots learned to fly on their own initiative. The bulk of the government's pilot program was operated in connection with colleges and universities. Students paid approximately $30 and received a minimum of 35 hours of flight instruction, plus a considerable amount of preliminary ground instruction in regular classes. Selected students were chosen for an additional 35 hours of advanced training. Noncollege groups were taught to fly under the auspices of various civic groups, working under C.P.T. program supervision, after ground instruction had been given. When the program was started in 1939 there was no talk of military value in the plan. However, by the fall of 1940, students accepted for training had to indicate a willingness to join military units if they were called upon. Refresher courses were also being given men who had previously learned to fly, but who had not kept up their flying.

Under the tremendous stimulus of the government's flight training program, the fixed-base operators also had their best year to date. These operators sell aeroplanes, teach flying, rent aeroplanes, conduct charter services and operate repair shops. They are the backbone of the non-air-line civil aviation in the U.S. Prior to the start of the government's C.P.T. program, many fixed-base operators lived on a hand-to-mouth basis, selling a few aeroplanes per year and earning some money from renting planes to private pilots. The Civil Aeronautics authority wisely decided to turn over its flight instruction to this group of men. In the program the operators supplied the aeroplanes and the instructors and were paid a flat rate for these services. Profits were not large but they could be depended upon. Activity at an airport breeds more activity and the government's pilot program quite definitely stimulated flying in all parts of the country. On July 1, 1940, at the end of the government's fiscal year, there were 41,006 certified pilots. This was 56·8% more than the 26,144 in 1939. By Dec. 31, 1940 it was estimated there were more than 65,000 active pilots.

Manufacturing of Civil Planes.—Approximately 6,880 civil aircraft were built in the U.S. in 1940 as contrasted with the 3,715 built in 1939. Increases were in all branches of civil aircraft: transport, light planes and larger planes for private fliers. Great impetus was received in the light plane field (two- and three-passenger ships) from the government's pilot program. Over 4,500 planes of this type were built. The largest single type built was the two-place tandem trainer used for instruction purposes.

Technical Developments.—There were no radical changes in design in either aeroplanes or engines during 1940. Refinements in interiors were the outstanding changes in small aeroplanes. The trend was to "automobile type" cabins, with better upholstery, wider windows and better-designed instrument panels. Designers improved the cowling around engines in light planes but made few other changes in exteriors. Almost no changes were made in the design of transport planes except in the Boeing Model 307 planes introduced by Transcontinental & Western Air and by Pan American airways. Each of these lines purchased several of the large Boeing land planes. These were the first pressurized commercial planes built for flying in the substratosphere. At about 8,000 feet the interior of the plane is supercharged so that although the aeroplane may fly at much higher levels, pressure felt by passengers is that of 10,000 to 12,000 feet altitude. This makes for increased comfort to passengers. This aeroplane is equipped with four engines.

In the field of aeroplane engines the trend was to greater horsepower. Light plane engines had been producing but 40 h.p. Since 1937 the power output has been growing until in 1940 65-h.p. engines were most popular and an increasing number of 75-h.p. engines were being built. Light engines were more dependable than at any time in aviation history.

Under pressure from the military services, the power of large radial engines has been pushed up each year. While radial engines of 1,100 h.p. were standard equipment with many air lines in 1940, engines developing 1,550 h.p. were in use on Pan American's At-

AN AMERICAN "FOOL-PROOF" PLANE—the "Ercoupe"—was placed on sale in the summer of 1940. The plane cannot slip into a spin, and, with its tricycle landing gear, will not ground-loop. In the picture, the pilot is landing with both hands off the steering wheel

lantic clippers. Engines of 2,000 h.p. were built and the engine factories built experimental engines with considerably greater power.

The contest between radial and in-line engines continued. The two largest engine builders in the United States have won their enviable reputation on air-cooled radial engines. In a desire to secure an engine with less frontal area, offering less resistance to the air stream, the U.S. army air corps encouraged the building of a liquid-cooled in-line engine which in 1940 was being turned out in quantities for several military aeroplanes. This engine, however, had far less power than the largest radial engines being built. The U.S. navy, using radial engines, claimed faster aeroplanes than the army could build around its in-line engine. As in previous years, diesel engines played almost no part in the U.S. scene.

Accessories.—Due to the demand for better aeroplanes and equipment, there was steady progress made all through the accessory field, although there were no outstanding inventions making their appearance for the first time. Because of pressure from the service departments of both military and civil flying, equipment was more easily maintained than before. The air lines especially have put great emphasis on the desirability of simple maintenance. All parts of the aeroplane and engine must be designed so that they can be easily inspected and quickly removed during overhaul.

In the field of private flying considerable advance was made in small radio sets for communication between the aeroplane and the ground. In 1940 it was necessary for pilots approaching many large airports to have at least a receiving set, in order that directions might be received from control towers. Radio sets were considerably cheaper than a few years earlier.

Airports.—In most countries of the world civil airports have been taken over for military purposes. In the United States the government continued its policy of using WPA labour to improve municipal airports. This has been a valuable contribution to civil aviation. At the middle of 1940 there were 2,655 airports in the U.S., some 200 more than at the beginning of 1940. Hundreds of fields were being improved.

As military flying increased, the lack of sufficient fields for private flying was becoming serious in a number of cities. The situation near New York city was typical. Many private fliers and fixed-base operators had been forced to leave the old North Beach airport when it was bought by the city for an air-line field. This later became La Guardia field. Operators and pilots moved over to the municipal Floyd Bennett field. However as a naval reserve aviation base there became more active, there was a possibility of all private aviation being forced to leave. There was no other nearby field to accommodate them. Because of the government's flight training program, increased air-line and military activities, all airports were crowded. There was talk in congress of voting huge sums for new airports but this had not been done.

Civilian Schools.—Under the terrific impetus of training men for jobs throughout the aviation industry, civilian aviation schools in the U.S. thrived as never before. The army used civilian schools for two purposes: to train pilots and to train mechanics. Selected schools were chosen for each type of training. This is the first time since 1918 that private schools have been used by the air corps.

New schools sprang up in all aviation manufacturing centres to prepare the thousands of men needed for factory work. The greatest concentration of schools was in southern California, the second greatest near New York city. Many public school courses were offered, especially short courses in such subjects as aircraft sheet metal which could be given in a few months and put to quick use in aeroplane plants. In some sections public schools were operated on a three-shift basis. (*See* also AIR FORCES; AIRPORTS AND FLYING FIELDS; GASOLINE; MEDICINE; PSYCHOLOGY, APPLIED; PUBLIC HEALTH ENGINEERING; RAILROADS; UNITED STATES: *Transportation.*) (C. N.)

Aviation, Military: *see* AIR FORCES; BLOCKADE; EUROPEAN WAR; MARINE CORPS; MUNITIONS OF WAR; PSYCHOLOGY, APPLIED; *see* also under various countries.

Avila Camacho, Manuel (1897–), president of Mexico, was born at Teziutlan in the state of Puebla on April 24. After completing a course of commercial studies in his native town he joined the successful revolution against Victoriano Huerta in 1914 and was promoted through various grades in the army to the rank of general of division. In the cabinet of President Rodriguez he was minister of war and navy. President Cárdenas later appointed him secretary of national defence and personally selected him as successor to the presidency.

On Nov. 3, 1939, he was formally nominated as the presidential candidate of the Mexican Revolutionary party.

Avila Camacho's principal opponent for the presidency was Gen. Juan Andreu Almazán, who had a considerable following among the nation's conservatives. In the election of July 7, 1940, Avila Camacho handily defeated Almazán, with the help—according to Almazán supporters—of "influence" exercised at the polls. On Sept. 12 the Mexican congress formally declared Avila Camacho the winner by 2,476,641 votes to 151,101 for Almazán. The latter, who had threatened assumption of power by force, dropped his claims to the presidency Nov. 26, and Avila Camacho was duly inaugurated Dec. 1. In his inaugural address the new president pleaded for unity of the American republics. One of his first official acts departed from Cárdenas' semicommunistic agricultural policies by restoring communal farmlands to the farmers working on them. Prior to his election, Avila Camacho had declared his opposition to communism. On Dec. 4 Archbishop Martinez of Mexico City issued an appeal to all Mexican Catholics to collaborate with the new regime.

Azaña y Diez, Manuel (1880–1940), ex-president of Spain, was born in Alcala de los Henares in Castile on Jan. 10. He was educated at the Augustinian academy at El Escorial and began his career as a playwright and author. For 12 years he was secretary of a literary society in Madrid, during which he won fame as a critic who expressed his opinions freely. He was indifferent to politics until the establishment of the republic in 1931, when he became minister of war in the provisional cabinet. His army reforms were unpopular with the officers and are said to have been largely responsible for the revolt led by General Franco in 1936. When Niceto Alcala Zamora was deposed as president in 1936, Azaña was chosen to succeed him. In November, however, the revolt led by Franco forced him to flee from Madrid to Barcelona, and he moved with his cabinet from place to place until it was apparent that his cause was lost. He then went to Paris and took refuge in the Spanish embassy. He died Nov. 4 at Montauban, France.

Azerbaijan S.S.R.: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Bacon. Production of sliced bacon in the U.S.A. during the 12 months ending Oct. 31, 1940 was 313,119,482lb. compared with 266,814,540lb in the 12 months ending Oct. 31,

1939. The 1940 production was an all-time record. From 1935 to 1940 inclusive production of sliced bacon in the United States steadily increased at the rate of about 12% annually. A new technique was developed to handle the product at predetermined temperatures with machines especially designed to turn out thousands of pounds per day and the time required between slicing and packaging reduced to seconds. Bacon is one of the principal processed meat foods with which the American Meat institute is trying to restore the volume of meat consumption (*see* MEAT).

Meat consumption in the United States has declined from 162·6 lb. per capita in 1908 to 131lb. in 1939. Output of bacon increased greatly in Canada during 1940 owing to the record number of hogs and to the wartime orders of bacon and hams to be shipped to the United Kingdom.

In the first 10 months of 1940 slaughter of hogs in Canada was 4,049,794 head compared to 2,747,733 in the same period in 1939. The British government contracted to take 5,600,000lb. of bacon and hams weekly through the year ending Oct. 31, 1940. This amount was increased to 8,176,000 lb. weekly for the year ending Oct. 31, 1941. (*See* also HOGS.)

Monthly Output of Sliced Bacon in U.S., 1939 and 1940

Month	Year ending Oct. 31, 1940 lb.	Year ending Oct. 31, 1939 lb.
November	22,903,197	19,967,669
December	22,336,794	18,607,520
January	24,778,179	19,860,787
February	21,755,898	18,169,033
March	23,306,006	20,793,982
April	26,593,341	19,982,489
May	26,857,536	23,214,142
June	27,450,204	24,547,610
July	30,525,151	24,651,037
August	30,898,065	27,289,035
September	28,227,275	25,928,665
October	27,487,836	24,802,723

(S. O. R.)

Bacteriology. The experimental study of infantile paralysis (poliomyelitis) has been retarded due to the fact that no experimental animal other than the monkey had been found susceptible to this disease. Recently the eastern cotton rat, *Sigmodon hispidus hispidus,* has been found susceptible to only one strain of the virus of poliomyelitis. This strain has been designated the Lansing strain since it was isolated from the brain and cord of an 18-year-old boy who died of bulbar poliomyelitis in Lansing, Mich., in 1937. The eastern cotton rat was found to multiply readily in captivity and not to be vicious. In this animal the symptoms observed were a roughened appearance of the fur and a tendency to react by violent jumping when agitated, followed by flaccid paralysis which may involve the legs in all combinations. Respiratory difficulty has also been observed. Since 26 serial passages from rat to rat the virus became progressively better adapted with an incubation period (from intracerebral inoculation to appearance of symptoms) of from 3–5 days. Since adapting the virus to the eastern cotton rat it was found that the rat virus could be subsequently adapted to the white mouse. An appreciable percentage (68·7+) of human serum mixed with Lansing mouse virus and injected into white mice protected them against this virus. Serum from individuals who have not experienced clinical poliomyelitis may neutralize the virus as well as serum from patients convalescing from poliomyelitis. The percentage of sera giving protection increased with the age of the donors. More protection was shown by sera of persons living in orphanages than by those of the same age group living in private urban dwellings.

Considerable work is being done by groups of bacteriologists and chemists on accessory factors necessary for the growth of microorganisms. Some haemolytic streptococci require vitamin B_6 in addition to other accessories such as riboflavin and pantothenic acid. Pantothenic acid is needed by certain diphtheria bacilli, especially the gravis type. Beta-alanine, which is a portion of the pantothenic acid molecule, is insufficient for these strains. Dysentery bacilli can be grown in a synthetic amino acid medium with nicotinic acid or nicotinamide. A study of many related compounds has revealed a striking similarity between those promoting the growth of bacteria and those alleviating the symptoms of pellagra in man and blacktongue in dogs.

Advances are being made in chemotherapy of bacterial infections. New derivatives of sulphanilamide are being prepared and tested. Sulphathiazole is one such product which has been found efficient in the treatment of some infections caused by staphylococci. Sulphanilylguanidine is fairly soluble in water but is poorly absorbed from the intestinal tract. This property should make the drug of value in the treatment of intestinal infections. Both of these drugs are in the experimental stage and much more careful study of them is necessary before they can be recommended as valuable therapeutic agents.

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Badminton. David G. Freeman of Pasadena, Calif., one of the first ten in tennis in 1938, repeated his claim to the title in 1940 by a second victory over his two-year rival Walter Kramer. Freeman also shared the 1940 titles in the men's doubles with Chester Goss of Los Angeles, and in the mixed doubles with Miss Sara Williams of Spokane, Wash.

Miss Evelyn Boldrick of San Diego, Calif., led the women for the national title, while in the championship doubles the Misses Elizabeth Anselm and Helen Zabriskie, both Californians, proved that their superior net work was sufficient to claim the crown of the shuttlecocks.

The game made considerable headway in the east, with the sectional plums falling to Harold Seavey of Boston in the singles and to John Laimbeer and Julian H. Burgiss in the men's doubles. Other eastern champions were Miss Mary Hagan, women's singles; Miss Helen Gibson and Mrs. Wanda Bergman, women's doubles; Mr. and Mrs. William Faversham, mixed doubles. Paul Vancso led the way to the Metropolitan (New York) singles crown as he did in 1939. (J. B. P.)

Badoglio, Pietro (1871–), Italian soldier, was born at Grazzano Monferrato, Piedmont, on Sept. 28. Entering the army as a youth, he took part in the Eritrean campaign in 1896–97 and by the time of Italy's entry into the World War in 1915 had advanced to the rank of lieutenant colonel. His military genius was readily recognized by his superiors during the next three years; he was promoted six times and emerged from the war a general. Elected a senator in 1919, he went to Brazil

as ambassador in 1924, then returned to Rome the following year upon his appointment as chief of the army general staff. He was created Marchese del Sabotino in 1928 and during the next five years was governor general of Libya. His strategy in Ethiopia during the spring of 1936 brought about the unexpectedly rapid rout of Haile Selassie's forces and won for him the title of Italy's first soldier. He was appointed high commissioner for Italian East Africa in Nov. 1935 and viceroy of Abyssinia in 1936, but resigned from the latter office and was created duke of Addis Ababa. Marshal Badoglio assumed command of all Italian armed forces on June 11, 1940 after Mussolini's declaration of war against the Allies. Less than two weeks later he signed the Italo-French armistice. He was reputedly opposed to the Italian invasion of Greece, Oct. 28. At any event, he became the scapegoat for its initial failures and was relieved as chief of the general staff "at his own request" on Dec. 6.

Bahamas, a British colony and island group east and southeast of Florida; language, English; capital, Nassau (pop. 19,756); governor, H.R.H. the duke of Windsor; area 4,375 square miles. The population (1931 census: 59,828) was officially estimated at 67,729 in 1939. Government is administered by an appointed governor and legislative council and an elected assembly. On July 9, 1940, H.R.H. the duke of Windsor was appointed governor and commander-in-chief of the colony, succeeding Hon. Sir C. C. F. Dundas.

History.—During 1940 the European war continued to be the dominant factor in developments in the Bahamas. Over £20,000 for purchase of aircraft for the royal air force was raised by popular subscription and the colony's £250,000 surplus loaned the imperial government, interest free, for the duration of the war. Most important for its future effects upon the colony was the Anglo-United States "destroyer-base" agreement of Sept. 3 (*see* West Indies, British) under which the United States received rights to base a naval and air base "on the eastern side of the Bahamas." The colony was subsequently visited by a United States mission and, in December, by Pres. Roosevelt.

Trade and Communication.—External communication is by air from Miami and by steamship, including a subsidized service from New York to Nassau. These services are vital to the maintenance of tourist trade, the most important factor in the Bahamas' economy, valued at $5,000,000 annually. This traffic, along with a steady flow of funds for real estate investment, serves to offset the "unfavourable trade balance."

In 1939 imports were £180,281. Imports, largely foodstuffs, constituting 29·6% of the total, and spirits, motor cars and parts, tobacco, boots and shoes and cotton goods came principally from the British empire (Great Britain, 20·3%; Canada, 13·2%) and from the United States. Exports comprised especially sponges (39·97%); tomatoes (14·7%); and timber (8·7%). Other exports include crawfish, bark, sisal hemp and tortoise shell. Exports are taken chiefly by the United States (39·9%), Canada (22·1%) and Great Britain (17%). These export commodities and fish for local consumption are the chief products.

Education.—Education is compulsory. In 1939 there were 64 government schools with 10,376 pupils, 56 aided schools with 3,021, an industrial school (103 enrolment), and 49 denominational and private schools with 2,710 pupils. The government contributed £33,786 toward education. Secondary education is provided by a government high school and three denominational schools.

Finance.—The monetary unit is the pound sterling.

Bibliography.—*The West Indies Year Book, 1940.* (L. W. Be.)

Bahrein Islands: *see* British Empire.

Bailey, Sir Abe (1864–1940), South African financier, was born in Cradock, Cape Colony, Nov. 6. Before he was 23 he had become a millionaire in South Africa by trading in gold shares. For the next 50 years he played a prominent part in the affairs of South Africa. He was knighted in 1911 and was created a baronet in 1919. Involved in the Jameson raid on the Transvaal in 1895, he was sentenced to death with John Hays Hammond and others, but the sentences were commuted and he served only 13 months in prison. He died in Cape Town, Aug. 10.

Baker Island: *see* South Sea and Equatorial Islands.

Balance of Trade: *see* International Trade.

Balbo, Italo (1896–1940), Italian statesman and aviator, governor general of Libya, was born in Ferrara, Italy, June 6. When Italy entered the World War in 1915 he enlisted in an Alpine corps and was decorated with three medals for gallantry. At the end of the war he founded the newspaper *L'Alpino* in Udine and was one of the early supporters of the cause of the fascists. He was appointed undersecretary for air in Mussolini's cabinet in 1926 and in 1929 was appointed general of the air fleet and air minister. In 1933 he commanded 24 hydroplanes which flew from Rome to the Century of Progress fair in Chicago and return. The flight made him so popular in Italy that he was mentioned as a possible successor to Mussolini. He was then appointed air marshal and governor general of Libya. He was killed June 28, according to an Italian communiqué, in an air battle over Tobruk, Libya, while fighting British planes.

Balkan Entente. A diplomatic alliance of four Balkan states, Greece, Rumania, Turkey and Yugoslavia, which had its origin in conferences of the foreign ministers of these countries which culminated in the conclusion of a four-power Balkan pact in Belgrade on Feb. 2, 1934, formally signed in Athens on Feb. 9, 1934. According to this pact, the four countries mutually guaranteed the security of their Balkan frontiers and undertook to concert together in regard to the measures to be taken. This pact, which was directed against the territorial claims of Bulgaria, was declared to be open to any Balkan country; but all efforts to draw Bulgaria into the Balkan pact and thus to induce her to give up her revisionist claims failed. The pact was to remain valid for seven years, and was considered renewed automatically by tacit agreement for the period of seven years, failing denunciation by any one of the signatories one year before the date of expiration. Thus a power wishing to denounce the pact had to do so before Feb. 9, 1940.

In subsequent statutes the Balkan Entente gave itself a firmer organization by creating a permanent council composed of the ministers of foreign affairs, which was to meet at least twice a year. In addition, an Advisory Economic council for the progressive co-ordination of the economic interests of the four states was constituted. The high hopes for a growing co-operation among the four Balkan states and for the ultimate foundation of a Balkan federation, to secure the peace and freedom of all Balkan peoples, were not realized. The countries did not wish to commit themselves to promises of mutual and automatic assistance; Yugoslavia especially, strongly under the influence of Germany and Italy, resisted any tightening of her obligations.

The outbreak of the war in 1939 increased the tension in the Balkans. Rumania felt herself threatened by the Soviet Union and by Germany, who now acted in co-operation, with Germany seeming to support Hungary's claims against Rumania. Turkey felt uneasy in view of the Russian-German rapprochement, and concluded a treaty of alliance with Great Britain and France.

"HELP!" The cops and robbers were all robbers as far as the Balkans were concerned in 1940, according to Herblock of NEA Service

Greece, distrustful of Italy's intentions in Albania, accepted a British-French guarantee of her independence and drew closer to Turkey. Italy and Hungary tried to win Yugoslavia away from the Balkan Entente and from any possible support to her Rumanian ally, and thus with the help of Yugoslavia to disintegrate the Balkan Entente as its counterpart, the Little Entente, had been destroyed.

In conformity with its statutes, the Balkan Entente conference met on Feb. 2, 1940, in Belgrade. The Turkish foreign minister, Shukru Saracoglu, who represented his country at the conference, made it clear that Turkey would adhere to her alliance with Great Britain. Premier and foreign minister of Greece, John Metaxas, took generally a similar stand. The Rumanian foreign minister, Grigore Gafencu, tried to enlist the definite assistance of the other countries for defence of Rumania against any aggression. On the other hand, Yugoslavia's delegate, Foreign Minister Alexander Cincar-Markovitch, opposed any strengthening of ties among the Balkan countries. In view of the war situation, the attention of the world was focused on the meeting, but it was completely barren of any decision. The automatic continuation of the Balkan pact for another seven years was agreed to, but the respective national interests of the four countries seemed too divergent to permit any common stand to save themselves from the domination of foreign powers and to maintain their peace and liberty by collective action. Although the Entente was formally continued, the hope of closer Balkan unity which had animated many of the progressive Balkan patriots and their friends, and which alone could have guaranteed the peaceful development of the Balkan peoples, seemed ended, at least for the time being. The three days' conference closed with a hollow declaration of the four nations' "determination to maintain a common vigil over the preservation of each member state's rights to independence and territorial integrity." Bulgaria and Hungary were appealed to to enter into friendly relations and pacific collaboration with the Entente. Subsequent events confirmed the disintegration of the Balkan Entente. Rumania had to cede territories to Hungary and to Bulgaria, without being able to count upon the support of her closest ally, Yugoslavia, with whom she had been united in the Little Entente and in the Balkan Entente. Yugoslavia worked hand in hand with Italy for the formation of a Yugoslav-Hungarian Entente. Greece had to face alone the onslaught of Italian fascist forces, supported only by Turkey's sympathy. Thus 1940 witnessed, under the pressure of the fascist forces, a rapid decline of the Balkan Entente similar to that which the Little Entente had suffered the year before. (H. Ko.)

Ballet: *see* DANCE.

Balloon Barrage: *see* AIR FORCES; MUNITIONS OF WAR.

Baltimore, metropolis of Maryland; area 78·58 sq.mi., 13·35 additional sq.mi. water; population (1940 census) 859,100; 7th city in United States, having moved ahead of St. Louis. Resident live births (1939) 12,525, including 3,314 Negro. Birth rate per thousand 14·4 (white 13·2, Negro 19·1); (1940, 11 months) total 12,600 live births, including 3,229 Negro, increasing rate to 15·7 (white 14·6, Negro 19·9). Death rate (1939) 11·9, with 14·3 Negro; (1940, 11 months) 12·9, with 16·1 Negro.

History.—The city officials in 1940 were: Mayor, Howard W. Jackson; comptroller, R. Walter Graham; president city council, Richard C. O'Connell. Terms expire 1943. Sewer loan of $5,000,000 was approved by referendum in Nov. 1940. Paving loan for the same amount was disapproved. Daylight saving ordinance was disapproved by narrow margin. The first low-cost housing project was completed and opened for Negroes. Seven such projects were approved, estimated cost $20,760,000. Three were for white families and four for Negroes.

Education.—Public elementary and high schools had a net roll (June 1940) of 110,823, including 30,197 Negroes; (June 1939) 112,243, including 29,782 Negroes. Roman Catholic elementary and high school enrolment (1938–39) was 35,414; other private schools, 3,207. New features in public educational program included extension of cultural advantages in art and music under a Carnegie grant and training for employment in defence industries.

Finances.—Appropriation for 1941 from the tax levy was $52,475,208, an increase of $1,456,271. Approved expenditures for special purposes from existing and tentative loans increased the total to $62,099,251. The taxable basis for 1941 was $1,501,117,794, an increase of $8,418,006 over 1940. The tax rate increased 5 cents for 1941 to $2.85 per hundred. Ninety-seven cents out of the tax rate was for debt service. Debt service was $13,158,031, over half for debt retirement. Gross funded debt as of Dec. 1, 1939 was $186,491,579 and as of Sept. 30, 1940 was $175,646,079. When sinking fund and self-liquidating debt are deducted the 1939 net general debt was $103,304,424, and for 1940 was $99,293,956. Funds available for public improvements under the pay-as-you-go plan were $10,862,600 for schools and sewers.

Trade and Manufactures.—Thirty-four new industries and 98 expansions in existing plants, representing $32,280,000 plant investment were announced during 1940, an increase of 63% in value of plant investment over 1939. The expansion resulted directly from rearmament program. (C. B. S.)

Bananas. Imports of bananas by the United States in the year ending June 30, 1940, were valued at $29,272,617. Bananas are the only foreign fruit whose imports into the United States have not steadily declined since 1937. Shipments of bananas in 1940 were materially hampered in several countries by lack of shipping and wartime restrictions. It was estimated that Jamaica shipments for 1940 would be slightly under 10,000,000

stems, compared to 15,528,000 in the preceding year. Up to Sept. 14 shipments from Jamaica were 4,458,000 stems. Shipments from Guatemala the first seven months of 1940 were 6,350,000 stems, compared to 6,926,000 stems in the same period in 1939. Most of the shipments went to the United States, except 58,000 stems to the United Kingdom in June, the first to that destination from Guatemala in many months. It was estimated that 3,000,000 stems were lost in the Pacific coast banana zone of Guatemala through a violent storm in June. Costa Rican shipments the first eight months in 1940 were 2,053,754 stems as against 2,345,714 stems in 1939.

Banana shipments from Haiti from Oct. 1, 1939, to Sept. 20, 1940, were 2,140,412 stems, and for the year ending Sept. 30, 1939, they were 2,029,767 stems.

All shipments from Panama were to the United States and for the first six months of 1940 were 2,706,890 stems, valued at $1,237,073.

The foregoing data are from the U.S. bureau of foreign and domestic commerce. (S. O. R.)

Bankers Association, American: *see* AMERICAN BANKERS ASSOCIATION.

Bank for International Settlements. From the end of March to the end of Dec. 1939, *i.e.*, during the period of growing tension in Europe and the first four months of the war, the total of the bank's balance sheet was reduced from 606,500,000 to 479,700,000 Swiss gold francs. Since then the total has remained comparatively stable, amounting to 469,900,000 Swiss gold francs on March 31, 1940 and 485,700,000 on Oct. 31 of the same year. In the tenth annual report of the bank, published in May 1940, it is said that in a large measure the reduction in the balance sheet during 1939 "may be explained by a tendency among the various central banks, in present disturbed conditions, to maintain their foreign reserves either in gold or as direct deposits with banks in the markets where payments have to be made. It is satisfactory that the bank has been able to meet all its obligations without difficulty and still to maintain a high degree of liquidity." The volume of current business was, of course, also affected by the extension of warfare; nevertheless the bank continued to be entrusted with foreign exchange and gold operations, mainly for the account of neutral central banks. The result of business operations for the financial year ending March 31, 1940 showed a profit of 7,962,000 Swiss gold francs compared with 8,584,000 in the preceding financial year. This result permitted the distribution of a 6% dividend in gold without drawing on the special reserve fund. The annual report makes the following comments on the bank's activities: "The outbreak of hostilities has brought to an end business between countries at war with each other. Trading with the enemy acts and the various other measures for waging economic warfare as announced by the belligerent nations have curtailed or stopped business in many other directions. The policy of the Bank for International Settlements has been and is to confine its activities strictly to transactions whereby no question can possibly arise of conferring economic or financial advantages on any belligerent nation. A letter setting out the principles which the bank felt itself under obligation to observe was directed to all clients in December and has received general approval as giving expression to a policy of scrupulous neutrality."

In the period of acute tension in May 1940 the bank temporarily transferred its offices to Château-d'Oex in the Swiss mountains, but opened again in Basle at the beginning of the following October. (P. JN.)

Bankhead, William Brockman (1874–1940), U. S. statesman, was born in Moscow, Ala., April 12, the son of John Hollis Bankhead, who later was elected to the United States senate. He was graduated from the University of Alabama in 1893 and from Georgetown university law school in 1895. He then went to New York city with the intention of opening an office and joined Tammany Hall. He was ambitious to go on the stage, but his mother dissuaded him, and after two years in New York he went to Huntsville, Ala., where he began the practice of law. He served one term in the Alabama legislature and in 1916 was elected to the national house of representatives as a Democrat and was re-elected to 11 successive congresses thereafter. He was named chairman of the house rules committee in 1934 and floor leader in 1935, and in 1936 he was unanimously elected speaker to succeed Joseph W. Byrns, who had died in office. He was the keynote speaker at the Democratic national convention in Chicago in 1940 and was an active candidate for nomination for vice-president but was defeated in the convention. He died Sept. 15 in Washington, D.C.

Banking. Continued growth in deposits occurred during 1940 in the banking system of the United States, chiefly due to further large imports of gold to the U.S. from war-torn Europe, and to continued financing of the government which again operated at a substantial deficit. The number of banks in operation varied slightly from the previous year, standing at 14,952 on June 29, 1940, the latest date for which complete figures are available, as against 15,082 on June 30, 1939. Deposits, however, stood at $60,582,000,000, an increase of $4,590,000,000 over the figure of $55,992,000,000 shown a year earlier.

The most important of the total number of banks are those which are members of the Federal Reserve system, whether national or state banks or trust companies. These numbered 6,398 with deposits of $42,039,000,000 and constitute the backbone of the commercial banking system. The growth in deposits referred to above occurred primarily in this system, which accounted for a gain of $4,012,000,000. Reserves of member banks with the Federal Reserve banks reached an all-time high during the year, excess reserves on Oct. 18, 1940 standing at $6,868,000,000. At the same time gold stock in this country had accumulated to the record-breaking figure of $21,428,000,000. The great increase in bank deposits was accompanied by an increase in money in circulation to a new high mark of $8,700,000,000, the two together providing an unprecedented supply of funds. (For activities of the board of governors of the Federal Reserve system and the treasury in the field of money and credit control, *see* FEDERAL RESERVE SYSTEM.)

The rate of business activity as reflected in the turnover of bank deposits did not keep pace with the increase in deposits. Total loans of all member banks showed little change during the first half of 1940, country bank loans increasing while loans in New York city banks showed a decrease, with brokers' loans declining to the lowest levels on record. In the second half a considerable increase in loans occurred, due primarily to stepped-up activity under the federal defence program. Real estate loans increased, continuing a five-year period of growth amounting in all to a rise of 37%.

Holdings of U.S. government obligations, direct and guaranteed, increased substantially, notwithstanding greatly reduced yields. A further tendency of concern to banks was that of the elimination of tax exemption on government issues, a five-year taxable issue being offered successfully by the treasury in December at an interest rate of ¾%. Banks continued to reduce their holdings of corporate securities and to increase holdings of state and local government obligations.

Earnings of member banks of the Federal Reserve system showed an increase for the year ended on June 29, 1940, due to the sharp lift in earnings for the first half of the period. An analysis of these earnings shows that there was a further decrease in interest on securities, reflecting lower rates of return, but an increase in interest received on loans, which grew in volume, with increased acceptance of term loans. Trust department earnings, commissions and service charges on deposit accounts continued to be considerable factors, amounting to about 14% of total current earnings.

A rising tendency was evident in expenses, particularly salaries and wages, which were affected by the application of the Federal Wages and Hours law. In addition, all member banks were made subject to the Social Security act after Jan. 1, 1940.

On April 10, 1940, the president issued an executive order which, together with treasury regulations issued thereunder, provided that all transfers of credit, foreign exchange or other financial transactions involving Danish or Norwegian property shall be subject to license by the secretary of the treasury. Other countries were added to the list later as they suffered invasion, including Belgium, the Netherlands, Luxembourg and France. Italy was added during the year to those countries coming under the credit ban of the Neutrality act as a belligerent.

To facilitate the full co-operation of the banks in the national defence program, congress passed an act to permit the assignment

of claims under public contracts. A survey by the National Defense Advisory commission disclosed that the commercial banks of the country were ready to loan at least $3,000,000,000 to manufacturers for emergency defence plant construction. Defence loans by banks will be augmented by loans of the Reconstruction Finance corporation to private corporations and to government corporations organized to accumulate strategic commodities for use only in case of war emergency, namely, Rubber Reserve company, Metals Reserve company, Defense Supplies corporation, and Defense Plant corporation. In recognition of the need of increased participation by small business in the defence program, the National Defense Advisory commission appointed a director of small business activities who will co-operate with local banks and the R.F.C. in assisting such concerns in financing defence contracts. Further studies were made by the Temporary National Economic committee as to means of financing small business. The volume of new securities sold by corporations continued at a low level and the new offerings were chiefly for the refunding of old issues to take advantage of record low rates of interest rather than to raise new capital.

A convention for the establishment of the Inter-American bank was signed on May 10, 1940 by the United States and representatives of seven Central and South American countries, subject to ratification by those countries and the congress of the United States. (*See* also BONDS; FEDERAL LAND BANKS.)

Great Britain.—The shock of the war was felt with increasing intensity by the banking system throughout the year 1940, every effort being directed toward facilitating the functioning of defence industries. Commercial bank deposits increased for the year ending Aug. 31, from £2,245,000,000 to £2,481,000,000. After an increase directly after the outbreak of the war in 1939, the volume of loans receded somewhat, while government security holdings increased. The banks assisted the British treasury in mobilizing foreign balances and certain United States dollar securities in the hands of British investors, which were directed to be turned over to the Bank of England against payment in the sterling equivalent.

Canada.—The forces of recovery at work in the previous year were augmented in 1940 by continued concentration on production for the prosecution of the war. The banking system was called upon to absorb a large part of the government securities issued for this purpose. Restrictions were progressively tightened on export of Canadian funds and securities by the Foreign Exchange Control board, whose regulations were issued to the banks as the only authorities, besides post offices and express companies, allowed to deal in foreign exchange. The balances of the chartered banks with the Bank of Canada rose from $221,127,000 to $231,336,000 during the year ended Sept. 30, 1940. The gold reserve of $225,000,000 was transferred to the Foreign Exchange Control board against short-term government securities. Note circulation rose from $212,490,000 to $331,957,000. The ten chartered banks reported a successful year with improved earnings in some instances. Deposits increased from $2,524,000,000 to $2,689,000,000 during the year ended Aug. 31, 1940. Earning assets were still preponderantly in investments, which increased during the year from $1,507,000,000 to $1,569,000,000, while commercial loans increased from $957,000,000 to $1,062,000,000.

Europe.—International movements of funds continued to affect banking in 1940, particularly just before the invasion of France and the Low Countries. After May 1940, banking figures were not available for Denmark, Norway, the Netherlands, Belgium, Luxembourg and France, because of the invasion of these countries by Germany. The latter country last reported commercial bank figures for the year ended June 29, 1940, showing a progressive increase in deposits with a rise in loans and bills discounted and a reduction in security holdings. The Reichsbank reported continued increase in note circulation from 10,995,000,000 marks to 12,847,000,000 marks in the year ending Sept. 30, while treasury bill holdings increased from 10,105,000,000 marks to 13,206,000,000 marks, indicating inflationary tendencies due to the war effort. Central European countries gradually came under the economic influence of Germany, due partly to the British blockade. The Bank for International Settlements still continued operations, but with very limited functions. (*See* also BANK OF FRANCE; EXCHANGE CONTROL AND EXCHANGE RATES; FINANCIAL REVIEW; SAVINGS BANKS, MUTUAL.) (E. B. L.)

Bank of England. As in more normal times, throughout 1940 the Bank of England worked in co-operation with the treasury, acting as the government's agent and adviser within its purview. In the summer of 1940 this link was strengthened by the appointment of Lord Catto, a director of the bank, to the new position of financial adviser to the treasury.

Internally the bank's main task was to keep money plentiful and easy, while preventing the growth of monetary inflation. As other and equally important tasks, the bank was concerned in the issue of the various war loans. In February it helped to carry through the conversion of the 4½% conversion loan into 2% 3–5 year bonds. This meant that only £100,000,000 of the old loan of £350,000,000 had to be repaid in cash on July 1. The 3% war loan of £300,000,000, issued in March, was very well timed, as its issue just preceded the outbreak of active warfare. In June, when the French collapse unsettled the stock markets and so made it doubtful whether another big loan could be placed, the decision was taken to issue 2½% National War bonds on tap. Initial subscriptions to these helped to finance the conversion loan repayment, and a steady stream of subscription continued.

In its main task the bank had to contend with the growth in public expenditure financed out of borrowing from the banking system; and with a growing demand for currency during the summer. In June the device was adopted of asking the clearing and Scottish banks to lend their surplus cash to the government against treasury deposit receipts; and up to Dec. 31, 1940, £338,000,000 had so been borrowed. This kept within bounds direct borrowing from the Bank of England, with a consequent enlargement of the credit base. Government securities held by the bank only (in both departments) rose by £43,000,000 between the outbreak of war and Oct. 8, 1940.

Fear of dislocation of communications, air raid damage and possible invasion caused the clearing banks and also many members of the public to hold additional currency reserves. Hence the growth of £70,000,000 in the note circulation between May 8 and Aug. 14. This growth necessitated an increase in early June of £50,000,000 in the fiduciary issue. After Aug. 14, these apprehensions subsided, despite the more intensive air attacks. Thus part of the additional notes returned from circulation.

Externally, the bank co-operated in the strengthening of the foreign exchange control. Agreements with foreign countries and also with some leading American banks enabled a system of special accounts to be set up. Payments for imports and exports and other international transactions pass almost entirely through these accounts. Therefore nearly all exchange transactions pass through the hands of the authorities at the official rate of exchange, and very few reach the New York free market in sterling. The latter therefore has been practically killed, and control over all foreign exchange resources is complete.

The German occupation of a large part of Europe meant that there was danger of Bank of England notes held by European nationals falling into enemy hands. The risk was lest the enemy might realize these notes in New York. To prevent this, the importation of bank notes was prohibited in August, though a few days' grace was given after the announcement of the order. A certain quantity of notes was probably returned during the days of grace, and this helps to explain the drop in the note circulation which then occurred. A few weeks later a similar prohibition was imposed on the importation of British bearer securities.

Bank of England
(£ million)

	1939 Aug. 30	1940 Jan. 3	1940 May 8	1940 June 5	1940 Aug. 14	1940 Oct. 9
Issue dept.						
Note issue	563	580	580	580	630	630
Note circulation	529	547	544	569	614	601
Gold	263	...	...	...	...	...
Fiduciary issue	300	580	580	580	630	630
Banking dept.						
Public deposits	31	17	33	14	31	19
Bankers' deposits	90	129	108	119	108	115
Other deposits	39	53	45	50	49	52
Govt. securities	113	153	139	162	162	146
Discounts & advances	6	5	5	3	5	7
Other securities	25	25	23	23	21	22
Reserve	34	34	37	12	17	29
"Proportion" (%) (ratio of reserve to deposits in banking dept.)	21.3	16.9	20.1	6.8	9.2	15.8

(N. E. C.)

Bank of France. Very little information of a financial character was forthcoming from France, even before the surrender of June 1940. The Bank of France's return, up to May 30, the latest date available, shows that during the war the French government borrowed heavily. The money so obtained and disbursed by the government led to an expansion of about 40% in the note circulation.

There was only a small drop in the bank's gold reserves, but it is understood that shortly before the June armistice the bulk of the bank's gold was shipped to the United States for safer custody. It presumably comes under the U.S. administration's "freezing" order, and so is immobilized.

After the German occupation of Paris and northern France, the Bank of France was believed to have come under German control. Little authentic news was forthcoming, but there was thought to have been a further substantial growth in the note circulation, to finance the expenses of the German army of occupation and other French government expenditure, and also German purchases of French commodities. The backing of these extra franc notes was probably reichsmark notes of one kind or another.

Bank of France
(Fr. millions)

	Aug. 17, 1939	Dec. 28, 1939	May 30, 1940
Assets			
Gold	97,266	97,267	84,616
Commercial bills	8,925	13,324	25,072
Advances on securities	3,450	3,482	3,716
Loans to state			
(a) general	10,000	10,000	10,000
(b) provisional	20,577	20,473	..
Provisional advance to state	..	14,200	32,600
Negotiable treasury bonds	..	..	30,000
Liabilities			
Notes in circulation	123,135	141,322	170,853
Deposits, public	5,146	1,913	1,046
Deposits, private	20,425	14,351	25,453

(N. E. C.)

Bankruptcy. The year 1940 saw no major additions to the legislation which had made the period from 1933 to 1938 notable by vastly extending the scope of the Bankruptcy act. Chapter XV, the Railroad Adjustments act (Public No. 242, 76th congress, 1st session) expired during 1940; while the operation of chapter IX, providing for the readjustment of debts of taxing districts, was extended until June 30, 1942, and counties and parishes were expressly added to the other taxing units which may utilize that chapter (Public No. 669, 76th congress, 3rd session). In clarification of the law an amendment to the tax statutes (Public No. 699, 76th congress, 3rd session) further defined the basis of valuation of debtors' property for income tax purposes upon consummation of reorganization proceedings under chapters X, XI and XII of the Bankruptcy act. And, *inter alia,* the Investment Company act of 1940 (Public No. 768, 76th congress, 3rd session) amended section 44 of the Bankruptcy act to provide that trustees in bankruptcy for face-amount certificate companies shall be appointed by the court alone, and altered section 67 of the act in order to achieve greater equality among creditors in the distribution of assets of such investment companies.

With the waning novelty of the legislation of the preceding six years, the content of court decisions and legal commentary turned predominantly to consideration of the interpretive and administrative aspects of these statutes. In these matters the court's rulings in 1940 were for the most part the usual judicial grist; a few were outstanding. In perhaps the most significant decision of the year the supreme court delineated the proper spheres of operation of chapters X (corporate reorganization) and XI (arrangements) of the Bankruptcy act, *Securities and Exchange Commission* v. *U.S. Realty and Improvement Co.,* decided May 27, 1940. The court's opinion by Justice Stone sustained the commission's argument that the reorganization of corporations in which there is a public-investor interest is appropriately the subject of proceedings under chapter X because of its express provisions for the protection and guidance of the public interest; and for that reason reorganization proceedings for such companies under chapter XI, which is lacking in comparable provisions, should be dismissed as not brought in good faith. Among these provisions was the one placing in the Securities and Exchange commission the duty to act as a party in chapter X cases for the purpose of aiding both the courts and the investor. During the year this aspect of the commission's jurisdiction enlarged in usefulness as the number of cases in which it participated rose above 150, and recognition of the value of the commission's activities was voiced increasingly by bench and bar.

The direction and impetus given generally to reorganizations in 1939 by the opinion of the supreme court in *Case* v. *Los Angeles Lumber Products Co., Ltd.,* 308 U.S. 106, clarifying the requirements of "fair and equitable" reorganization plans, were strongly reflected in plans for railroads under section 77, which in 1940 began to move toward consummation at an accelerated pace. Toward the close of the year the requirements of fairness in plans under the municipal, corporate and railroad reorganization chapters of the Bankruptcy act were further defined by the supreme court in *American United Mutual Life Insurance Company* v. *City of Avon Park, Florida,* decided Nov. 25, 1940. There, in an opinion by Justice Douglas, who became the court's leading spokesman on matters of bankruptcy and reorganization, the court ruled that in measuring the reasonableness of applications for allowances for fees and expenses in a chapter IX proceeding, the sum of all the emoluments to be derived from the proceeding by the applicant, including fees directly or indirectly charged and speculative profits from the acquisition of claims at discounts or defaulted prices, must be considered. The court held, also, that a person who seeks the assents of other security holders to a plan must fully disclose any benefits he will himself derive from the plan. If a person acting in such representative capacity fails to do so, the assents of others are not fairly obtained, and his own assents, representing his personal security holdings, are ineffective to make up the number required by the statute. The opinion reiterated the responsibility of courts of bankruptcy before approving a plan "to be satisfied that the plan in its practical incidence embodied a fair and equitable bargain openly arrived at and devoid of overreaching, however subtle," and emphasized the broad power of the courts to apply a variety of remedies suitable to the attainment of these ends.

At the close of the year the attorney general's committee on bankruptcy administration, completing its 20-month study of the act, submitted a report to the congress in which it suggested legislation to make effective two principal recommendations: that responsible and co-ordinated supervision of bankruptcy administration be made a permanent function of the administrative office of the United States courts; and that referees in bankruptcy, who in practical operation are the administrators of the Bankruptcy act, be placed on a full-time salary basis to replace the anachronistic fee system which has prevailed since the original enactment of the federal bankruptcy law. (*See* also RAILROADS.)

(J. N. F.)

Baptist Church. The Baptists of the U.S.A. are divided into two main bodies: the first, three groups totalling over 10,000,000 members; the second, 15 miscellaneous groups with some 500,000 enrolled. In the first division the Southern convention has a membership of over 4,500,000; the Northern, nearly 1,500,000; and the National (Negro) well over 3,500,000. Reports from the denomination as a whole indicate a loss in membership for the year, May 1939–May 1940.

The home mission and the foreign mission boards of the Southern convention reported increased gifts to their respective causes. The foreign board stated that Baptists in China are opening up new work. The China Baptist Theological seminary in Kaifeng, opened in Sept. 1939, is an example of this. It also reported that there are more missionaries in Africa than ever before—a total of fifty-eight.

The foreign board of the Northern convention presented an authorized budget of $891,320 for 1939–40 which was increased to $895,610 for 1940–41. Although the mission fields of this convention have greatly suffered from the ravages of war, nevertheless, some most encouraging reports were received. Again from China: "The net result has been that Christianity today faces perhaps its greatest opportunity in the long history of Christian missions in China."

In Japan, on Jan. 3–5, 1940, the two Baptist conventions—the East, associated with the Northern convention in the United States, and the West, associated with the Southern—consummated a union to be known as the "Japan Baptist Church." As was to be expected, the war threat to America concerned the conventions of 1940. At the Northern, the question of the denomination's recognition of conscientious objectors caused prolonged debate and in the Southern, the menace to religious liberty gave deep concern.

(R. E. E. H.)

Bar Association, American: *see* AMERICAN BAR ASSOCIATION.
Barbados: *see* WEST INDIES, BRITISH.

Barley. The 1940 barley crop in the United States was 309,235,000bu., as estimated by the department of agriculture Dec. 1. The 1939 crop was 274,767,000bu., and the ten-year (1929–38) average 225,486,000 bushels. Adequate and timely rainfall that was not heavy enough to promote the development of rust contributed to production that was about 37% above average. Acre yields were 12·6% above average, while the acreage was 23·1% above average. Nearly all the leading barley states had larger acre yields: Illinois 12bu. and Michigan 11bu. above average, Wisconsin 10bu., Indiana 9bu., Minnesota 8bu., Iowa 7bu., Missouri 6bu., and the Dakotas 3 bushels. In Canada the 1940 crop was estimated at 110,538,000bu. compared to 103,147,000bu. in 1939. In England and Wales the plowing up of pasture lands and other efforts to increase wartime production resulted in a 1940 barley crop of 45,800,000bu., unofficial estimate. The 1939 crop in England and Wales was 37,053,000bu. In Sweden the 1940 crop was 8,864,000bu.; that of 1939 was 11,494,000.

Agricultural statistics from other countries were not available because of wartime restrictions.

Barley Production by States, 1940 and 1939

State	1940 bu.	1939 bu.	State	1940 bu.	1939 bu.
Minnesota	57,348,000	59,808,000	Texas	3,825,000	2,955,000
California	33,516,000	30,850,000	New York	3,799,000	3,942,000
South Dakota	30,821,000	24,633,000	Utah	2,812,000	2,516,000
North Dakota	28,064,000	28,962,000	Virginia	2,376,000	2,320,000
Wisconsin	24,525,000	22,591,000	Maryland	2,172,000	2,160,000
Nebraska	22,544,000	14,651,000	Wyoming	1,838,000	1,560,000
Kansas	18,176,000	7,480,000	Kentucky	1,825,000	1,122,000
Iowa	14,553,000	13,271,000	Ohio	1,650,000	1,250,000
Colorado	9,368,000	7,956,000	Indiana	1,450,000	903,000
Idaho	5,950,000	5,580,000	Tennessee	1,320,000	962,000
Michigan	5,796,000	5,771,000	Arizona	1,184,000	1,156,000
Oklahoma	5,780,000	6,048,000	Nevada	540,000	525,000
Oregon	5,000,000	5,369,000	North Carolina	308,000	220,000
Illinois	4,928,000	3,602,000	West Virginia	306,000	270,000
Montana	4,692,000	5,088,000	New Mexico	264,000	240,000
Missouri	4,094,000	3,822,000	New Jersey	196,000	150,000
Pennsylvania	4,030,000	3,658,000	Vermont	150,000	140,000
Washington	3,915,000	3,120,000	Maine	120,000	116,000

(S. O. R.)

Barnes, George Nicoll (1859–1940), Scotch labour leader, was born Jan. 2. He was elected to parliament as a Labour candidate from a Glasgow division in 1906 and served until 1922. He was a member of the war cabinet in 1917 and was minister plenipotentiary to the Paris peace conference in 1919. He was the author of several books on the labour movement. He died in London, April 22.

Barrère, Camille (1851–1940), French diplomat, was born at La Charité-sur-Loire in October, a grandson of one of the presidents of the national convention of the first republic. In 1880 he was the French delegate on the international commission for the regulation of the Danube. He was then appointed minister to Egypt and later represented France in Stockholm, Bucharest, Berne and Munich. In 1897 he was made ambassador to Rome, serving there for 32 years. He was influential in persuading Italy to abandon the triple alliance during the World War of 1914–18 and to join with France and Britain. When the Italian representatives left the peace conference because of dissatisfaction with the disposal of Trieste, he persuaded them to return. He thrice refused to enter the cabinet as minister of foreign affairs. He died in Paris, Oct. 8.

Basalt: *see* STONE.

Baseball. In attendance the American league reached a record with a season's gross patronage of 5,433,791 persons, far in excess of the National league figures which were estimated to be 300,000 short of the 1939 campaign. In the aggregate the combined attendance figures for both the American and the National leagues were placed in excess of 10,000,000. The growth in popularity of night baseball was undeniable. Playing under arc lights extended until ten of the 16 major league clubs booked night games. Another club was to join the experimenters in 1941, when the Washington Senators would install a lighting system. This will leave only the New York Yankees, the Boston Red Sox and the Detroit Tigers in the American league, and the Chicago Cubs and the Boston Bees in the National league, without lighting apparatus. The St. Louis Browns in the American league, by special legislation adopted by the league's directors, received permission to play 14 night games at Sportsman's park in St. Louis, an arrangement which proved highly profitable for the club and popular with the club's followers.

World Series.—Manager McKechnie of the Cincinnati Reds added to his year's laurels when his club won the world series in seven games, the first postseason interleague struggle to go the maximum number of games since 1934. Detroit won the first game, 7 to 2, in Cincinnati before a crowd of 31,793 persons. Five runs in the second inning routed Paul Derringer, Cincinnati's opening pitcher, and gave Buck Newsom a victory he richly deserved. In the second game Bucky Walters rallied from a shaky start to fashion a 3-hit performance as his mates batted Lynwood (Schoolboy) Rowe out of the game in the fourth inning, picked up another run on Johnny Gorsica in the fifth, and won the game, 5 to 3.

The third game was played in Detroit before a crowd of 52,887 persons and resulted in a Detroit victory, 7 to 4, when home runs by Rudy York and Frank (Pinky) Higgins, each struck with a runner on base, broke a 1-all deadlock and decided the issue in the seventh inning. Before a crowd of 54,093 persons Paul Derringer came back in the fourth game, played in Detroit, to score the first world series triumph of his career, 5 to 2, limiting Detroit to five hits as Frank McCormick, Ival Goodman and Bill Werber led a Cincinnati assault on Paul Trout, Clay Smith and Archie McKain that squared the series for the second time.

Buck Newsom's father died suddenly of a heart attack after a quiet celebration following the Detroit pitcher's triumph in the first game. The husky right-hander had to forgo attendance at the funeral in Hartsville, S.C., because Detroit's hopes depended so completely upon his amazing pitching strength. But Newsom, putting aside his grief, came back to score his second victory in the fifth game, 8 to 0, limiting Cincinnati to three solitary singles in a game featured also by Hank Greenberg's third-inning home run with two mates on base and witnessed by 55,189 persons, the largest crowd of the series.

The scene shifted back to Cincinnati for the sixth game and Bucky Walters, allowing Detroit but five hits, pitched Cincinnati to victory, 4 to 0, contributing a home run to the attack that squared the series for the third time. In the seventh and final game, Paul Derringer scored his second triumph, 2 to 1, doubles by Frank McCormick and Jimmy Ripple accounting for two seventh-inning runs that ended an American league series reign dating back to 1935 and gave Cincinnati its first series championship in 21 years, or since the dark days of the 1919 Black Sox scandal. This victory also clinched for manager McKechnie of the Cincinnati club, known as "Deacon Bill," the unique distinction of being the first manager in baseball history to win a world series with two different clubs.

He won his first with the Pittsburgh Pirates in 1925. It was the third victory of the year for McKechnie over the American league. He had managed the National league team in a 2 to 1 victory over the American league in a training camp all-star game played in Tampa, Fla., March 17, in the interests of the Finnish Relief fund. He was also the manager of the National league team which conquered the American league in the all-star game staged in mid-season.

A total of 281,842 persons saw the seven-game series. The aggregate receipts amounted to $1,321,817.84, including $100,000 for the radio rights to the series, a new income record. The former record was $1,304,399 by the New York Yankees and the New York Giants in 1936. The players' pool amounted to $373,830.56, which compares with the $380,117.84 pool for the 1939 series in which the New York Yankees beat Cincinnati four straight games. The discrepancy is found in the 80,000 seating capacity of the Yankee Stadium in New York.

The Season's Race.—Cincinnati's National league victory in the championship season was easily scored, in contrast to a bitter fight for supremacy in the American league. Manager McKechnie's team dislodged Brooklyn as leaders in the National league on July 7 and remained in front to the finish of the season, winning the pennant with a 12-game margin over Brooklyn. St. Louis was

HANK GREENBERG of the Detroit Tigers sliding safely into second after doubling in the fourth game of the 1940 World's Series. Joost of the Cincinnati Reds is just receiving the ball. Cincinnati won the series, 4 games to 3

third, 16 games back of the victors. Pittsburgh, Chicago, New York, Boston and Philadelphia finished in that order, Philadelphia 50 games off the pace. Cincinnati compiled a winning total of 100 games, the third National league club to attain the century mark since 1913. Not until Sept. 27, two days before the season was to close, did Detroit clinch the pennant in the American league. The Yankees, sliding most of the year, rallied and actually attained first place briefly on Sept. 11 when they won the first game of a double-header in Cleveland, marred by a vegetable shower from disgruntled fans. The Yankees dropped from the lead when they lost the second game which was limited to six innings because of rain, and faded thereafter. Cleveland's Indians, contenders for the pennant all year, suffered through internal strife. The Detroit club, playing smoothly as the Yankees and the Indians floundered, clinched the pennant amid a vegetable shower in Cleveland Sept. 27, Bobby Feller bowing to Floyd Giebell, a rookie right-hander who was not even eligible for the world series. Cleveland finished second, one game back; the Yankees third, two games away. Chicago, Boston, St. Louis, Washington, and Philadelphia finished in that order, Philadelphia 36 games away from Detroit.

The discharge of Charles Leo (Gabby) Hartnett as manager in a postseason shakeup of the Chicago Cubs in the National league and the engagement of Jimmy Wilson as his successor; the discharge of manager Vitt by the Cleveland club and the return of Roger Peckinpaugh, who had managed the club before the days of Walter Johnson, as manager, were outstanding personnel changes.

Comparative Statistics.—In the eighth renewal of the midseason All-Star game, played at Sportsman's park, St. Louis, July 9, a composite team of National league players defeated a composite team of American league players by a score of 4 to 0. It was the third National league victory in the eight games played. The contest was witnessed by 32,373 persons and attracted receipts of $42,420.79.

Hitting supremacy remained with the American league, especially in the matter of home runs. Batters in this circuit accounted for 883 home runs, while the National league players hit 688. The Yankees led the American league with 155 home runs. Six clubs each hit in excess of 100 home runs. St. Louis led the National league in home runs with 119, the only club in this circuit to exceed the 100-mark.

The individual leaders in home runs were Johnny Mize of the St. Louis Cardinals with 43, and Hank Greenberg of the Detroit Tigers with 41.

The best all-around batting average for the season was made by a National league player, Debs Garms, of the Boston Bees. He finished with a percentage of .355. In the American league Joe DiMaggio of the New York Yankees was the batting leader. His percentage was .352, 29 points lower than his 1939 average. At the finish their standings were as follows:

	Games	*At Bat*	*Runs*	*Hits*	*Percentage*
Garms	103	358	76	127	.355
DiMaggio	132	508	93	179	.352

Feller's opening day no-hit, no-run game was the only such full-time game of the American league season. He had the league's finest pitching record. He also pitched a 1-hit game, a 2-hit game, three 3-hit games, two 4-hit games, appeared in more games than any other American league pitcher (43), pitched the most innings (320), faced the most batters (1,168), pitched the most complete games (31), shared with Ted Lyons (Chicago White Sox) and Al Milnar (Cleveland Indians) the distinction of pitching the most shutouts (4), and led the American league pitchers in winning percentages (.711), as well as earned run average (2.62). In the National league William H. (Bucky) Walters of the Cincinnati Reds again was the leader, with an earned run average of 2.48. Following are the comparative standings for the season for Feller and Walters, in games pitched, games credited as won, and games charged as lost:

	Games	*Won*	*Lost*	*Percentage*
Feller	43	27	11	.711
Walters	36	22	10	.688

The best won and lost record for the two major leagues was furnished by the 39-year-old Freddy Fitzsimmons of the Brooklyn Dodgers, who won 16 games and lost 2 for a percentage average of .889 in 20 games.

The Minor Leagues.—After beating the Baltimore Orioles 4 games to 3 in the International League's Governor's Cup final

play-off series, the Newark Bears won the "little world series" from Louisville, American association representative, 4 games to 2. It was the Bears' third victory in the annual series. In other minor league competition Nashville won the Southern association pennant and beat Houston, winners of the Texas league pennant, 4 games to 1 in the Dixie world series. Scranton again won the Eastern league pennant. For the second straight year Seattle won the championship in the Pacific Coast league.

College Baseball.—Losing but one game in 11, Cornell university won the Eastern Intercollegiate Baseball championship with a percentage of ·909. Dartmouth, Columbia, Yale, Princeton, Harvard and Pennsylvania followed in that order. In the Western conference, Northwestern university and the University of Illinois tied for the championship, each with a record of 9 victories and 3 defeats and percentages of ·750. Iowa, Minnesota, Michigan, Wisconsin, Indiana, Ohio State, Purdue and Chicago followed in that order. It was the first time Northwestern gained championship distinction. (J. P. D.)

Basketball. An estimated 90,000,000 persons attended college, school and club games in the United States during 1940. Fifteen intercollegiate double-headers played in Madison Square Garden, New York, attracted 212,672 spectators, with an average attendance of 14,178.

There is difficulty in ranking teams in their proper order, yet Colorado was picked at the top of the list because it won the third annual intercollegiate invitation tournament in New York and its third straight victory in the Rocky Mountain Big Seven. It lost, however, the divisional semifinal of the N.C.A.A. Indiana won the N.C.A.A. tournament, was runner-up to Purdue in the Big Ten conference, and excelled in 20 of its 23 games.

An unusual result in big-time games was the three-way tie between Kansas, Oklahoma and Missouri for the Big Six conference, after Kansas was eliminated in the finals of the N.C.A.A. Purdue did well in winning the Big Ten championship, the 13th time to share in or win the title. Southern California won the Pacific Coast conference and was runner-up to Kansas in Western N.C.A.A. play-offs. New York university was the Metropolitan (New York) champion, winning 18 out of 19 games. Dartmouth was champion of the Eastern league for the third year.

Other sectional leaders were Rice, winner of the Southwestern conference; Kentucky won the Southeastern conference; North Carolina led for the Southern conference.

The national A.A.U. championship was won by the Phillips Oilers team of Bartlesville, Okla., victors over the previous year's Denver Nuggets. Because players from 25 states were represented in this annual fixture, in Denver, sports writers and officials announced their selection of an All-American A.A.U. team, comprising five Denver players and four members of the Phillips team. The leading district association team of the A.A.U. was the Ohrbach A.A. quintet, of New York, Metropolitan champions. (J. B. P.)

Basutoland: *see* British South African Protectorates.

Batista, Zaldivar Fulgencio (1901–), Cuban soldier and statesman and president of the republic since 1940, was a tailor's apprentice, agricultural worker and mechanic during his youth, and later managed a sugar cane plantation. He joined the national army in 1921 and the rural guard in 1923; later he was a clerk at staff headquarters. He took a prominent part in the various uprisings against Gerardo Machado's dictatorship from 1931 to 1933, and after the latter's downfall was appointed chief of staff of the army by the revolutionary government. In this office he became in effect the dictator of all Cuba and thus governed the nation for seven years despite periodic promises of a popular election. In Dec. 1939, however, Batista announced that he would be a candidate in the presidential election of 1940.

A Socialist-Democratic coalition formally nominated him president April 7, 1940, and in the election on the following July 14 he defeated his opponent, Ramon Grau San Martin. Charges of voting frauds threatened to delay Batista's inauguration, but he was installed in office at Havana on Oct. 10.

Battleships: *see* Marine Corps; Navies of the World.

Bauxite. An increasing demand for aluminium has stimulated the production of bauxite in a number of countries that were formerly only minor producers, particularly Yugoslavia, Hungary, Italy, Netherlands East Indies, Greece, and the Soviet Union, but has not yet materially affected the output of the other large producers; the increased output of the last two is largely for home consumption, but that of the first four goes largely to Germany.

World Production of Bauxite
(Metric tons)

	1929	1932	1937	1938	1939
Br. Guiana	220,119	85,800	366,700	382,400	483,700
France	666,348	401,430	688,200	682,400	680,000
Greece	..	..	137,400	179,900	180,000
Hungary	389,152	111,558	532,700	540,700	570,200
Italy	192,774	86,553	386,500	360,800	380,000
Neth. E. Indies	..	..	199,000	245,400	220,000?
Surinam	219,603	126,513	392,400	377,200	504,100
U.S.S.R.	..	37,400	230,000?	250,000?	250,000?
United States	371,648	97,895	431,400	315,900	381,300
Yugoslavia	103,366	67,086	354,233	396,400	314,400
World Total	2,185 000	1,017,000	3,750,000	3,850,000	3,900,000

On the average, about 60% of the output is used for metal, while the remainder goes into chemicals, abrasives, cement and refractories. (G. A. Ro.)

Beans, Dry. The United States crop of dry beans in 1940 was estimated in October as 14,977,000 bags, uncleaned (100lb. to the bag). The 1939 crop was 13,962,000 bags and the ten-year (1929–38) average, 13,086,000 bags. Increased production was particularly marked in California, where a crop of 2,058,000 bags of lima beans and 2,954,000 bags of field beans was indicated, a 1940 total of 5,012,000 bags compared with 3,990,000 in 1939.

Dry Bean Production by States, 1940 and 1939
(in 100 lb. bags)

	1940	1939		1940	1939
California	5,012,000	3,990,000	Nebraska	228,000	154,000
Michigan	3,952,000	4,520,000	Maine	92,000	100,000
Colorado	1,659,000	1,360,000	Arizona	50,000	23,000
Idaho	1,560,000	1,351,000	Vermont	19,000	18,000
New York	1,057,000	1,134,000	Oregon	16,000	18,000
New Mexico	656,000	409,000	Wisconsin	10,000	9,000
Wyoming	605,000	460,000	Minnesota	8,000	9,000
Montana	235,000	207,000	Kansas	3,000	2,000

(S. O. R.)

Beaverbrook, William Maxwell Aitken, 1st Baron (1879–), British publisher and statesman, was born May 25, the third son of a Scotch Presbyterian minister stationed at Newcastle, N.B., Canada. Educated in the public schools of Newcastle while he peddled newspapers, he entered business and formed a successful merger that earned him a fortune. He went to London, entered politics and was elected member of parliament in 1910. He was with the Canadian expeditionary force in France in 1915 and later was officer in charge of Canadian war records. In 1918 he was appointed chancellor of the duchy of Lancaster and minister

of information. Meanwhile, in 1917, he had purchased control of the London *Daily Express,* a failing newspaper which by the 1930s he had converted into the largest daily in the world, with a circulation in excess of 2,500,000. Lord Beaverbrook, as he was known after 1917, also became publisher of the *Sunday Express* and the *Evening Standard.*

On May 14, 1940, he was named by Winston Churchill minister of aircraft production, and on Aug. 2 he was admitted to the war cabinet. Lord Beaverbrook began his new assignment with the typical energy that characterized his commercial ventures. On May 21 he ordered week-end labour for all aircraft factories and later he called upon all workers in aircraft industries not to desert their labours during air raids. In recognition of Beaverbrook's efforts to speed up the manufacture of British warplanes, Prime Minister Churchill declared that his minister had "worked magic" in producing planes for the royal air force. See also *Encyclopædia Britannica,* vol. 3, p. 282.

Bechuanaland Protectorate: *see* BRITISH SOUTH AFRICAN PROTECTORATES.

Beckham, John Crepps Wickliffe (1869–1940), former governor and U.S. senator from Kentucky, was born in Bardstown, Ky., Aug. 5, and was educated at the Central university. He was admitted to the bar while principal of the high school at Bardstown. In 1893 he was elected as a Democrat to the state house of representatives and was speaker in 1898. The next year he was elected lieutenant governor on the ticket headed by William Goebel. Goebel was later assassinated and the legislature declared that Beckham thereupon became governor. He was then elected to serve out the unexpired term and was elected again for a full term, serving until 1907. When he ran for the senate in 1908 he was defeated, but was elected six years later. In his later years he served as chairman of a commission to reorganize the state government and as chairman of the Kentucky Public Service commission. He was a delegate to the Democratic national conventions from 1904 to 1920, inclusive. He died in Louisville Jan. 9.

Bedford, Herbrand Arthur Russell, 11TH DUKE OF (1858–1940), was born in London, Feb. 19, and was educated at Balliol college, Oxford. He was lord lieutenant of the county of Middlesex from 1898 to 1926, aide-de-camp to King Edward VII and King George V from 1908 to 1920, and served in the regular army from 1914 to 1919. He had also served in the Egyptian campaign of 1882 and in India from 1884 to 1888. He died at Woburn Abbey, Aug. 27.

Beef: *see* MEAT.

Bee-keeping. Honey production in the U.S. in 1940 was privately estimated as substantially under the normal output of 160,000,000lb. but approximately 10% over the 1939 yield, while in Canada the 1940 crop was estimated as about that of 1939, which was officially reported at 11,500,000lb. compared with 16,000,000lb. in 1938. The U.S. department of agriculture does not make similar reports and, as the *American Bee Journal* points out, estimates are often little better than guesses.

Bee-keeping in the U.S.A. has been in a decline for several years, partly owing to continued low prices and partly because of decrease in bee pastures, particularly smaller buckwheat acreage.

National honey week was observed Oct. 28 to Nov. 2, 1940, as part of the effort carried on by national, state and local associations of bee-keepers to increase the consumption of honey. The American Honey Producers league held its annual meeting Oct. 22–24, 1940, at Omaha, Neb. (S. O. R.)

THIS WHOLE HIVE of wild honeybees was caught for domestication in the summer of 1940 at Richmond, Mass.

Beer, Thomas (1889–1940), U.S. author, was born in Council Bluffs, Iowa, Nov. 22, and was graduated from Yale university in 1911. He studied law in Columbia university, but abandoned it for a literary career. His first short story was published in the *Century Magazine* in 1917. He served as a private, then as first lieutenant with the U.S. army in France in 1917–18. His first novel, *The Fair Rewards,* was published in 1922. His most successful book was *The Mauve Decade,* published in 1926. He wrote biographies of Stephen Crane and Mark Hanna. He was the master of a brilliant prose style for which he received much praise. He died in New York city, April 18.

Beer: *see* BREWING AND BEER.
Beetle: *see* ENTOMOLOGY.
Beet Sugar: *see* SUGAR.

Belgian Colonial Empire. The table on page 90 gives essential material relative to Belgium and the colonial and mandated territories administered by it. Total area 960,000 sq.mi.; total population (est. Dec. 31, 1937), 22,298,000.

History.—According to the colonial charter and to the Belgian constitution, the government of the Congo, in the absence of the king, should be exercised by his colonial minister and by the governor general. One of the first initiatives taken by the Belgian cabinet, after the collapse of France, was to send to London the colonial minister, M. de Vleeschauwer, with full powers to organize the resistance of the Congo in collaboration with Great Britain. From the beginning of July 1940 the position of the colony and its future contribution to the common cause were made perfectly clear.

The attitude of the governor general, M. Ryckmans, was no less resolute. In Sept. 1940 he was able to declare that the native army (15,000 strong in pre-war days) had been considerably reinforced, and that further measures were under discussion with the British military mission, recently arrived at Leopoldville. The strategic position was improved in Oct. 1940 by the contacts established with General de Larminat, governor of free French Equatorial Africa.

Other steps were taken, in conjunction with the British mission under Lord Hailey, to overcome the economic difficulties follow-

Belgian Colonial Empire

Country and Area sq. miles (approx.)	Population (000's omitted)	Capital, Status, Governors, Premiers, etc.	Principal Products exported 1938 (in metric tons)	Imports and Exports 1938 (in thousand francs)	Road, Rail and Shipping 1939	Revenue and Expenditure (in thousand francs)
BELGIUM, 11,775	(est. Dec. 31, 1939) 8,396	Brussels, kingdom, *King:* Leopold III *Premier:* M. Hubert Pierlot	wheat (total) 547,874 coal (total) 29,575,500	imp. 23,166,507 exp. 21,723,953	rds. main, 6,571 mi.; rly. 3,190 mi.; shpg. cleared (monthly av.) 2,502,000 net tons.	(est. 1940) rev. 11,343,000 exp. 11,633,000
AFRICA BELGIAN CONGO, 927,000	(est. Dec. 31, 1938) 10,329	Leopoldville, colony, *Governor General:* M. Pierre Ryckmans	copper 160,271 gold 13,505 kg.	imp. 1,022,637 exp. 1,897,154	rds. main, 3,206 mi.; other 39,718 mi.; rly. (1939) 3,051 mi.; shpg. cleared 132,673 net tons.	(est. 1939) rev. 675,453 exp. 730,380
RUANDA and URUNDI, 21,200	(est. Dec. 31, 1938) 3,753	Nianza (Ruanda), Kitega (Urundi), mandated territory united administratively with the Belgian Congo	coffee 3,390 tin 1,384	imp. 62,301 exp. 64,861	. . . . .	. . . . .

ing the loss of the Belgian market, and to use the Congo's vast resources in raw materials for the prosecution of the war. In this connection the export of copper, tin and tin ore, and certain agricultural produce, such as cotton and oil, would play an important part. All its resources were mobilized on the basis of its ability to pay for its own defence. For statistics of production *see* COFFEE; COPPER; COTTON; MINERAL AND METAL PRICES AND PRODUCTION; TIN. (E. CA.)

Belgian Congo: *see* BELGIAN COLONIAL EMPIRE.

Belgium. Area 11,775 sq.mi.; pop. (est. Dec. 31, 1939), 8,396,276; chief towns (pop. Dec. 31, 1938): Brussels and suburbs (cap., 1,004,452); Antwerp (273,317); Ghent (162,858); Liége (162,229). Ruler: King Leopold III; prime minister: Hubert Pierlot; languages: French and Flemish.

A REFUGEE FAMILY of Belgium in May 1940

History.—When war broke out, Belgium was governed by a coalition cabinet including representatives of the three principal parties, Catholics, Socialists and Liberals. At the previous elections the Rexists, who had totalitarian leanings, had been severely defeated.

Following the failure of the big powers to come to an understanding after the denunciation of the Locarno treaty by Germany (March 1936), public opinion had urged upon the government a policy involving that the army should only be used for the defence of the country's territory. This policy of non-commitment had been formally recognized in 1937 by Great Britain and France, and by the Reich. Belgium was released of her obligations under Locarno and undertook to strengthen her defences, the powers maintaining their guarantee against aggression.

The Belgian declaration of neutrality, in Sept. 1939, was therefore the unavoidable consequence of previous developments. From the first day of hostilities, 500,000 men were stationed on the eastern frontier which had been strengthened by defensive works, but neutrality prevented military arrangements with the Allies. No defensive alliance had been concluded between Belgium and Holland, but the two countries were brought close together by their common danger.

The only notification received of the German aggression was the aerial bombardment of Brussels on May 10. The government appealed at once for the military support of Great Britain and France, and the king who, according to the constitution, is placed in command of the national forces, left Brussels for his headquarters. The story of the stubborn resistance of the forts of Liége and Namur, and of the field army, compelled to retire with the British expeditionary force after the break-through at Sedan, is told elsewhere. (*See* EUROPEAN WAR.) It is generally recognized that, owing to the enemy's mastery of the air and to the Belgians' lack of supplies, the situation of the latter had become extremely critical from May 22, and that, when Weygand's counteroffensive failed to materialize, capitulation became inevitable. King Leopold's decision to accept defeat, taken on May 27, was bitterly attacked at the time, because the public was under the illusion that the military situation might have been retrieved and because the British and French commands had not received messages sent from Belgian headquarters. The king did not leave the country, but retired to his castle at Laeken. In the orders of the day in which he endeavoured to stimulate the resistance of his soldiers, he had promised to "share their fate." Between his duty as head of the state and as chief of the army, he chose the latter and preferred to remain with his people in their ordeal rather than seek refuge abroad. He afterwards observed the status of a prisoner of war and resisted all attempts made by the Germans to enlist his support.

Since the king refused to leave Belgium, his ministers used the

powers conferred upon them by the constitution and placed all the country's remaining resources at the disposal of the Allies. The prime minister, M. Pierlot, in his speech broadcast from Paris on May 28, declared that he and his colleagues intended to pursue the fight at the side of Great Britain and France and that their policy remained the defence of Belgian territory. After the debacle of the French armies, the situation became very difficult owing to the fact that over 2,000,000 Belgians, including thousands of men of military age, had fled to non-occupied France. The situation was aggravated by the uncertain attitude of the Vichy government. As soon as the repatriation of the refugees took place, M. Pierlot and his colleagues endeavoured to leave the continent, but they were detained by the Spanish authorities. They only succeeded in reaching England in October.

Fortunately two Belgian ministers, M. Gutt (minister of finance) and M. de Vleeschauwer (minister of colonies) were already in London. They had been given full power to organize the resistance in connection with the British authorities. Belgian financial assets had been transferred to London and to the United States at an early date. The Congo with its large resources in raw material, remained intact. Its position was consolidated by the attitude of the French colonies of Central Africa. There were also in Great Britain some Belgian soldiers evacuated from Dunkirk, and a small number of airmen who joined at once in the defence of London. Reinforcements could be found among the 15,000 to 20,000 refugees in England, including men of military age and skilled workmen. Gradually, these resources were brought together and took a share in the common effort.

The Belgians who remained in the country were at first discouraged by the lightning speed of the invasion. After the collapse of France, some believed that further resistance would be in vain, but the successes achieved by the R.A.F. and the constant bombing of military objectives in Belgium soon convinced the majority that the struggle was not over. The old spirit of 1914 revived, encouraged in some quarters by the uncompromising attitude of King Leopold, and in others by the powerful influence of the leaders of the church and of Socialist trade unions. At the close of 1940 there were already evident signs that the Belgians would once more oppose with stubborn energy the efforts made by their German conquerors to divide them or to undermine their patriotism by persecutions and privations. (E. Ca.)

Education 1938.—Primary schools 8,712; scholars 955,038; higher schools 273; scholars 86,279; universities (1937–38) 4; students 10,776.

Defence 1939.—Army (inc. air force): 4,671 officers, 85,500 other ranks; mainly compulsory service (longest 17 months).

Banking and Finance.—Revenue, ordinary (est. 1940) 11,343,032,000 francs; expenditure, ordinary (est. 1940) 11,632,978,000 francs; public debt (Jan. 1, 1939) 57,334,571,000 francs; notes in circulation (Aug. 31, 1939) 26,496,000,000 francs; gold reserve (Aug. 31, 1939) 18,112,000,000 francs; exchange rate (average 1938) 28·93 belgas = £1 sterling; 5 francs paper = 1 belga.

Trade and Communication.—External trade (merchandise): imports (1939) 19,690,000,000 francs; exports (1939) 21,670,000,000 francs. Communications and transport: roads, suitable for motor traffic (1939) 6,571mi.; railways, open to traffic, main (1939) 3,190mi.; airways (1938), distance travelled 1,457,050mi.; passenger mileage 8,255,980mi.; baggage mileage 156,762 ton mi.; mail mileage 78,412 ton mi.; newspapers 52,504 ton mi. Shipping (July 1, 1939) 408,418 net tons; tonnage launched (July 1938–June 1939) 27,600 gross tons; vessels entered, in net tons, (monthly average 1938) 2,497,000; (July 1939) 2,801,000; cleared (monthly average 1938) 2,502,000; (July 1939) 2,803,000; motor vehicles licensed (Dec. 31, 1938): 155,174 cars; 77,600 commercial; 67,016 cycles; wireless receiving set licences (1938) 1,082,200; telephone subscribers, local (1938) 287,323.

THE FAMOUS BELGIAN UNIVERSITY TOWN of Louvain was occupied by German forces May 16, 1940, after a thorough bombing

Agriculture, Manufactures, Mineral Production.—Production 1938 (in metric tons); wheat 547,874; oats 621,062; rye 385,033; potatoes 3,258,433; coal 29,575,500; pig iron and ferro alloys 2,464,800; steel 2,212,000; beet sugar 1,201,631; barley (1939) 89,230; butter 64,150; margarine 59,331; artificial silk 5,800. Industry and labour: industrial production (1929=100) (average 1938) 79·9; (June 1939) 80·7; number wholly unemployed (average 1938) 131,909; (June 1939) 150,921; partly (average 1938) 160,571; (June 1939) 151,540.

Benefactions: *see* Donations and Bequests.

Benson, Edward Frederic (1867–1940), British author, son of a former archbishop of Canterbury, was born at Wellington College, England, July 24. He was educated at Marlborough school and King's college, Cambridge. After graduation he worked from 1892 to 1895 in Athens for the British Archaeological society and later in Egypt for the Hellenic society. In 1893 he published *Dodo,* a novel which attracted wide attention. It was followed by other successful novels and books on a wide range of subjects, totalling nearly 100. Among them were biographies of Queen Victoria, Gladstone and William II of Germany. In 1938 he was made an honorary fellow of Magdalene college, Cambridge. He died in London, Feb. 29.

Berlin-Rome-Tokyo Axis: *see* Chinese-Japanese War; Fascism; Germany; Hungary; Italy; Japan.

Bermuda Islands. A British insular colony 580mi. east of Cape Hatteras; language, English; capital, Hamilton (pop. 1,863); governor, Major General Sir Denis K. Bernard. The area is 19¼ sq.mi. The March 26, 1939 census showed a population of 30,516 (not including 4,907 tourists and members of the military and naval forces), of whom Negroes constitute 62·9%. The colony has an appointed governor and an elected assembly.

The European war and its ramifications dominated the course of events in Bermuda during 1940, with far-reaching economic and other consequences. By the close of the year the colony had become a major centre of operations for prosecution of the war itself, as well as a potential one for future defence of the western hemisphere. Its location made it a logical point of union for convoys bound from North America to Great Britain; for similar

HAMILTON HARBOUR, Bermuda, viewed from the air. The United States on Sept. 3, 1940, acquired 99-year leases to build air and naval bases on this island and seven other British possessions in the Atlantic

reasons, it became an important station for examination, under the "navicert system" of neutral shipping bound to and from continental Europe. These activities, in their turn, required considerable enhancement of the naval and military establishments from a March 1939 personnel of 1,098 to several times that figure. In addition, between 600 and 800 censors were located at Bermuda to censor trans-Atlantic mail to and from enemy-controlled countries. Three of the leading hotels were commandeered to house this staff. While the customary tourist traffic was at a fraction of its former volume, unofficial sources estimated imperial expenditures in Bermuda to be in excess of £1,000,000 a year. These, along with the spending power of convoy personnel and more than 1,000 British refugees temporarily located in Bermuda, very considerably stimulated economic activity.

Of more lasting, but less immediate importance, was the leasing by the United States of naval and air bases on the Great sound in Bermuda, as part of an agreement by which the United States traded 50 over-age destroyers for lease rights on these and similar bases in the British West Indies and elsewhere (*see* West Indies, British). Contracts for construction work at these bases were let in the United States late in 1940.

Regular government-subsidized steamship communication with New York, replacing the former service by a British line, was maintained under the United States flag during 1940. Air service from New York to Bermuda and by the Pan American Airways' trans-Atlantic line, on which Bermuda is a regular stop, was maintained during the year although westbound stops on the latter were temporarily suspended following controversy over mail censorship.

In 1939, imports (chiefly foodstuffs, textiles and manufactured goods) totalled £1,750,536 (from the United States, 46·4%; Great Britain, 27·2%; Canada, 16·4%); exports, including re-exports, declined 20·5% to £115,656, of which £39,039 (13·33% less than in 1938) constituted domestic produce, chiefly cut flowers, lily bulbs and fresh vegetables. Following the outbreak of the European war in Sept. 1939, imports were sharply curtailed. From Jan.–April, 1940, imports aggregated $1,798,784 U.S., supplied by the United States, Great Britain and Canada in roughly the same proportions as in 1939. Tourist expenditures normally offset the "unfavourable balance" between imports and exports. Under war conditions, tourist trade declined materially.

There are 30 government-aided schools, with an enrolment in 1939 of 4,670, or 15·3% of the whole population. (L. W. Be.)

Beryllium. The amount of newspaper publicity given to beryllium in 1939 in connection with the hearings of the Temporary National Economic committee tended to give the general public an exaggerated notion of the importance of the metal. However, definite progress was being made in the commercial application of the metal, and demand was expanding. There were in 1940 two producers in the United States, one of which makes the pure metal, alloys and compounds, while the other produces the 4% master alloy (which is the form in which it is most used) and various fabricated products, such as rod, strip, wire and tubing. The master alloy is quoted at $15 per pound of contained beryllium.

Beryl, the only ore used, is quoted at $30 and $35 per short ton f.o.b. mines for 10% and 12% ore, equivalent to $45–$55 at the consuming plant, but imported ore can be had somewhat cheaper, due to lower freight costs. U.S. imports were 459 short tons in 1939, while domestic production is estimated at 100–150 tons. (*See* also Metallurgy.) (G. A. Ro.)

Bessarabia: *see* European War; Minorities; Rumania; Union of Soviet Socialist Republics.

Best, Sir Matthew Robert (1878–1940), British admiral, was born June 18 and received his preliminary naval training on H.M.S. "Britannia." He rose through various ranks till he became an admiral in 1936. He served with distinction in the battle of Jutland in 1916. In 1927 he was chief of staff to the commander-in-chief of the Atlantic fleet and in 1929 he was in command of the second cruiser squadron of the same fleet. In 1934 he became commander-in-chief of the American and West Indies station. He died in London Oct. 13.

Besteiro, Julian (1870–1940), Spanish socialist statesman, was for many years professor of logic and dean of the faculty of philosophy at the University of Madrid. During the widespread strike of 1917 he was sentenced to life imprisonment by a military court but the king pardoned him in response to popular demand and he was soon thereafter elected to the chamber of deputies. He was the first speaker of the cortes (1931–33) under the Spanish republic. He headed the council of defence which surrendered Madrid to General Franco in March 1939. In July of that year he was tried on the charge of prolonging the war, and on Sept. 4 he was sentenced to 30 years in prison. He died in the prison at Carmona, Sept. 27.

Best Sellers: *see* Publishing: *Best Sellers.*

Bevin, Ernest (1884–), British labour leader and statesman. In his youth he was a truck driver in the vicinity of Bristol; later he became interested in trade unions and was elected general secretary of the Transport and General Workers' union. In 1937 he was appointed chairman of the General Council of Trades Union congress. On May 13, 1940 Churchill named him minister of labour and national service, and he was promoted to the war cabinet on Oct. 3. In these offices he showed phenomenal energy in helping to stiffen Britain's war effort by securing the collaboration of the working classes. On May 25 he announced a great speed-up plan for war production and established the Labour Supply board. He was often referred to during the year as "Britain's next prime minister." Long an enemy of British aristocracy, he declared in a speech on Oct. 26 that poverty and privilege would be abolished after the war. But in the meantime he applied himself to the defeat of fascism, which he had denounced as more inimical than the "ruling classes."

Bible Society, American: *see* AMERICAN BIBLE SOCIETY.
Bicycling: *see* CYCLING.

Bielschowsky, Alfred (1871–1940), director of Dartmouth University Eye institute, was born in a Silesian village, Dec. 11. He studied medicine at the universities of Breslau, Heidelberg, Berlin and Leipzig, receiving his medical degree from the University of Berlin in 1894. After a period of military service he studied ophthalmology at Leipzig, where he became chief of a university clinic. He became an authority on motor anomalies of the eyes. After the World War of 1914–18 he founded the Educational Institute for Blind Academicians. He went to the United States in 1934 as visiting ophthalmologist at Dartmouth and was made director of the Eye institute in 1937. From 1938 he served also as associate in ophthalmology at the Harvard medical school. He died in Brooklyn, N.Y., Jan. 5.

Biggers, John David (1888–), U.S. industrialist, was born Dec. 19 at St. Louis and was educated at Washington university in that city and at the University of Michigan, where he received his bachelor's degree in 1909. After several years (1910–14) with the Detroit board of commerce and the Toledo, O. chamber of commerce he became assistant treasurer of the Owens Bottle company at Toledo, and had advanced to vice president by 1926, when he became managing director of Dodge Brothers of Britain, Ltd. in London. In 1930 he was named president of the Libbey-Owens-Ford Glass company in Toledo. In 1937–38 he directed the U.S. census of unemployed.

Biggers was named deputy commissioner under William S. Knudsen (*q.v.*) on the U.S. Council of National Defense June 5, 1940. His special concern was industrial production for armaments. When the Office of Production Management was created by President Roosevelt Jan. 7, 1941, Biggers became executive director of the production division for this new "super-defence" board.

Billiards. Willie Hoppe, approaching his 53rd birthday, made billiards history in the spring of 1940. Unprecedented, indeed, was his brilliant string of 20 consecutive victories in the gruelling competition for the three-cushion championship of the world at Chicago. Without the loss of a single game the veteran New Yorker regained the title he last won in 1936. Although he had a number of close calls, and several times had to come from behind to triumph, Hoppe's stroking was the most consistent ever witnessed in a major tournament. He captured one of the matches by a 50–49 score, two by 50–48 and two by 50–47. His high run for the tournament was 12 and his best game, or shortest number of innings required to end a match, was 25.

Pitted against the man who, at one time or another, has held every major billiard championship, were 10 of the world's outstanding cue artists, headed by Joe Chamaco of Sonora, Mexico, the 1939 winner. The others in the field included Welker Cochran of San Francisco and Johnny Layton of Sedalia, Mo., each a former titleholder in his own right. Jake Schaefer and Arthur Thurnblad, both of Chicago, Otto Reiselt of Philadelphia, Tiff Denton of Kansas City, Allan Hall of St. Louis and Arthur Rubin of New York were the other entrants.

Aside from the competition for the pocket billiards championship of the world, there was little other activity in the sport during 1940. The pockets laurels were captured by Andrew Ponzi of New York, who last ruled in 1934. This tournament, staged on a home-and-home basis in various cities, resulted in a close victory for Ponzi. By virtue of having won 51 matches and lost 29 Ponzi succeeded Jimmy Caras of Wilmington, Del., as champion, Caras, having won one less and lost one more than Ponzi, finished in the runner-up position. Ponzi, incidentally, established a new high run record for championship play by putting together a cluster of 127 points in a single inning. (L. EF.)

Biochemistry. Important advances were made in 1940 in the fields of vitamins, hormones and intermediary metabolism.

Vitamins.—Vitamin-K activity is necessary to prevent fatal haemorrhages in baby chicks if kept on a diet free from this activity. The activity is found in alfalfa and in putrefied fish meal. That found in alfalfa is called vitamin K_1 and the other is known as vitamin K_2. Both have been obtained in pure form and the former has been synthesized. Vitamin K_1 is 2-methyl-3-phytyl-1, 4-naphthoquinone. Vitamin K_2, obtained from putrefied fish meal, was shown to be a 2,3-disubstituted-1,4-naphthoquinone of the empirical formula, $C_{41}H_{56}O_2$. A group of related 1,4-naphthoquinones was prepared and all possessed vitamin-K activity. These substances were found of value in the treatment of newborn children threatened with death from haemorrhage and similar dangerous haemorrhages in adults due to obstructive jaundice.

Pantothenic Acid.—This vitamin activity was discovered as an important yeast-growth stimulant. However, it probably also aids growth in mammals and man and may be of value otherwise. It not only aids growth in the chick and rat, but, more specifically, it prevents chick dermatitis and a special dermatitis in rats. It is necessary for the normal growth of yeasts and a number of bacteria. Its structure, which was determined by degradation studies, has been confirmed by its synthesis. It is the α-hydroxy-β β-dimethyl-γ-hydroxy-butyryl-β-alanine.

Vitamin H.—This is the curative factor which protects rats from injury by too large amounts of egg white in their diet. The latest findings (1940) indicate that this factor probably is identical with another yeast growth-stimulant known as biotin. The structure and synthesis were not accomplished.

Human Needs of Vitamins in General.—As a result of the development of very delicate chemical methods for thiamin, nicotinic acid, tocopherol (vitamin E), vitamin C, pantothenic acid, and vitamin B_6, the medical profession is now able (1940) to determine the rate of excretion of these substances in the urine of normal and sick individuals, and thus may detect deficiency diseases in the early stages when the usual symptoms have not appeared. The remarkable finding is that the body is very wasteful with most of these important substances and hence a liberal excess is necessary in the diet.

Hormones.—Some progress was made in the purification of the many hormone activities found in the pituitary gland. This is particularly true for the thyrotropic (thyroid-stimulating), ovarian follicle-stimulating, luteinizing (corpus-luteum forming) and mammary-gland stimulating fractions. All these substances appear to be proteins. The gonadotropic material obtained from pregnancy urine appears to be a glycoprotein, that is, a protein rich in carbohydrates. The adrenotropic factor probably is the same as the diabetogenic factor. In other words, diabetes may be due to an overstimulation of the adrenal cortex with or without exhaustion of the pancreas in attempting to counteract the too active adrenals.

Use of Tracers or Labelled Atoms in Studying Intermediary Metabolism.—The use of radioactive forms or isotopes of phosphorus, hydrogen, nitrogen, carbon, etc., in tracing where and how these elements are utilized by tissues continued to yield results which in part confirmed conclusions arrived at by other methods, but also led to new and astounding findings. Thus, with radioactive phosphorus as the tracer in phosphorus metabolism it was concluded, (1) that marked changes in phospholipins take place in the kidney in attempts to counteract loss of base due to NH_4Cl poisoning; (2) that the function of phosphocreatine hydrolysis in muscular contraction is to supply base for the neutralization of lactic acid; (3) that phospholipid metabolism is most active in the rat at birth and then rapidly declines in activity; (4) that bone and tooth phosphorus is easily replaced by radioactive phosphorus and hence teeth and bone must always be undergoing exchanges with constituents from the blood; (5) that the liver is involved in phospholipin synthesis and that kephalin probably is formed from lecithin by demethylation. From the use of radioactive sodium it was concluded that the membranes of muscle cells are permeable to sodium. By means of radioactive carbon supplied in the form of carbon dioxide or bicarbonate it was shown that not only plants, yeast and bacteria can utilize carbon dioxide in the synthesis of organic compounds, but it also was shown that liver tissue can utilize the carbon dioxide in the formation of α-ketoglutaric acid. Studies with heavy nitrogen-containing compounds indicated that sarcosine must be easily demethylated in the rat and then utilized like glycine in the transfer of heavy nitrogen to form other amino acids, ammonia and urea. By feeding heavy nitrogen in the form of guanido-acetic acid to rats, it was shown that creatine is formed therefrom. In the field of fatty acids, the feeding studies with heavy hydrogen-containing fatty

acids or the corresponding alcohols led to the remarkable conclusion that palmitic acid not only is converted into the unsaturated palmitoleic acid, but also into stearic acid which contains two carbon atoms more per molecule than palmitic acid. The results also indicate that long chain alcohols like cetyl alcohol are in equilibrium in the body with the corresponding fatty acids. (*See* also PHYSIOLOGY.)

BIBLIOGRAPHY.—*See* bibliography with article on MEDICINE. (F. C. K.)

Biography: *see* AMERICAN LITERATURE; ENGLISH LITERATURE; CHILDREN'S BOOKS; MOTION PICTURES.
Biology: *see* BIOCHEMISTRY; BOTANY; MARINE BIOLOGY; PHYSIOLOGY; ZOOLOGY.

Bird Refuges. There were (Jan. 1, 1941) 263 refuges for all forms of wild life, administered by the Fish and Wildlife service,[1] aggregating 13,595,812ac. All but 16 of these (4,094,202ac.), which were situated in Alaska, Hawaii and Puerto Rico, were in the United States. Of the total, 250 (6,595,997ac.) were primarily for birds and 13 (6,999,815ac.) were primarily for big game, but wild life in general was accorded protection on all refuges. Among important additional refuges acquired during the year 1940 were the Susquehanna Migratory Waterfowl Closed Area, in Cecil and Harford counties, Maryland, embracing 21,210ac. It is an excellent resting and feeding ground for ducks. At least 300,000 canvasbacks concentrated there. The Noxubee National Wild Life refuge, in Winston, Noxubee and Oktibbeha counties, Mississippi, containing 38,239ac., provides a haven for wild turkeys as well as waterfowl and other wild life. The Bosque del Apache National Wild Life refuge, in Socorro county, New Mexico, is noteworthy as a breeding ground for the rare New Mexican duck.

More than $1,111,000 were made available by hunters during the fiscal year ended June 30, 1940, for the continuance of the migratory-waterfowl restoration program through the sale of migratory bird hunting stamps as provided for under the Migratory Bird Hunting Stamp act (49 Stat. 379). Ninety percent of these funds are used for acquiring, developing and administering refuges for migratory waterfowl, and 10% for the enforcement of laws for the protection of migratory birds and the expenses of the post office department in engraving, issuing and accounting for the stamps.

Certain bird refuges were established by the Fish and Wildlife service for the special protection of some species threatened with extermination. Among those of this type are the Red Rock Lakes refuge, Montana, for the perpetuation of the trumpeter swan; Great White Heron refuge, Florida, for the great white heron; and the Aransas refuge, Texas, for the whooping crane. The number of trumpeter swans in the United States increased from 115 in 1936 to 212 in 1940, of which 128 were on the Red Rock Lakes refuge. There were in 1940 more than 1,000 great white herons on the Great White Heron and Key West refuges, whereas there were only about 600 in 1938.

Waterfowl and other wild life on the national wild life refuges showed a substantial increase in numbers in 1940 which was the fourth consecutive year, as a result of improved water, food and cover conditions and more adequate protection. There were 900,000 ducks and geese present on the Tule Lake refuge, California, in mid-October, more than have been observed at that season for many years. Some species not previously seen on the refuges were observed. Sandhill cranes stopped for the first time in the fall of 1940 on the Lower Souris refuge, North Dakota. Fulvous tree ducks nested on the Lacassine refuge, Louisiana, establishing a new breeding record for the refuge and one of the few for the state. A pair of king rails with 12 young was observed on Big Lake refuge, Arkansas, where the species had not previously been recorded. Eight species of birds were seen on the Aransas refuge, Texas, for the first time during the summer. Among these were the purple gallinule, clapper rail and Cabot's tern. (*See* also FISH AND WILDLIFE SERVICE; WILD LIFE CONSERVATION.)

(E. A. G.)

[1]The Bureau of Biological Survey and the Bureau of Fisheries of the department of the interior were combined under the new designation *Fish and Wildlife Service*, effective July 1, 1940.

Birth Control. With the outbreak of the war in 1939, the continued drive of the totalitarian nations for increased population and the subjugation of the democracies where birth control programs had been in progress, not only did activities cease in large part in those countries, but with the rigid censorship no news on what was transpiring filtered through.

The forced migration of millions of people in Central Europe, the starvation of millions more, the separation of families, with great bodies of troops either in movement or at the various fronts and away from home, all acted as a form of birth control. The malnutrition extending over large areas in Europe will affect fertility adversely during and after the European war. With these factors will come the fear of depopulation which manifested itself before the war. It is to be hoped that there will also follow increased recognition of the need for intelligent and honest efforts to solve the problems of population pressure, especially those dealing with population distribution in relation to national resources. Without such solution, a lasting peace can never be

TRUMPETER SWAN on the Red Rock Lakes national wildlife refuge in Montana. In the early 1930s many persons believed this bird was extinct; in 1940 more than 200 of the species were counted at the Red Rock Lakes refuge and in Yellowstone national park

achieved for these causes are basic reasons for aggression.

Emphasis in the United States birth control movement was, in 1940, on the need for expanding birth control services as a means of strengthening the physical and economic well-being of the nation as it planned for national defence.

Australia.—Birth control clinics continued to operate in Australia, but mothers in the low income group were given a maternity bonus of $20 on the birth of each child and in New South Wales a small weekly payment for each child after the first.

Cuba.—In Havana, films dealing with the "Technique of Contraception" were widely presented to the medical profession and the leading medical associations. There is particular interest in the birth control program of its neighbouring island, Puerto Rico, where efforts to solve similar problems of overpopulation have been under way for several years.

England.—Activities of the Family Planning association continued in Great Britain up to the outbreak of the war. Birth control clinics still functioned. The clinic of Dr. Marie Stopes, the first established in London, was bombed in an air raid in Oct. 1940 and partly demolished.

France.—The new code which went into effect late in 1939, not only provided new and drastic regulations against abortion, but prohibited the advertising of contraception. Because of censorship of everything published, including even a discussion of contraception, *La Grande Reforme*, the French Neo-Malthusian journal, edited by Eugene Humbert, suspended publication late in that year.

Following the conquest of France, Jean Ybarnegaray, minister of youth in the Vichy government, announced a new policy to stimulate the birth rate. The young women of France will be educated for one purpose only! "To return to their traditional purpose of life—being in their homes and living only to raise strong useful men." Fathers of families will be given preference over bachelors in both public and private employment and will be paid in proportion to the size of their families.

Germany.—Germany continued an uncompromising opposition to any form of birth control. In Dec. 1939, a new population policy was officially announced. All soldiers going to the front were expected to leave children or prospective children behind them.

Since the outbreak of the war, censorship in Germany has resulted in a complete cessation of all statistical material on population.

Holland.—New birth control clinics were opened in Amsterdam and Enschede, both in industrial sections where many factory workers live. This progress took place prior to the invasion of Holland. After that, no news was received.

India.—The All-India Women's conference, which met in Allahabad in Jan. 1940, adopted a new resolution on family planning which urged that women medical officers in municipal and government hospitals, dispensaries and health centres advise married women on child spacing and that the technique of contraception be taught these officers.

The National Planning commission appointed by the National congress passed a resolution that family planning and limitation of children were essentials in the interest of national economy and urged the state to adopt a policy encouraging the establishment of birth control clinics and other necessary measures to encourage the spread of cheap and safe methods of birth control.

Japan.—Japan's official pressure for a higher birth rate during the Sino-Japanese war resulted in an increase in the rate of infant mortality. Coupled with the demand for an increase in population, as a patriotic duty during the war, suppression of birth control clinics and of discussion of birth control continued.

New Zealand.—The Sex Hygiene and Birth Regulation society of New Zealand dissolved during 1940 to re-form as the Family Planning association, affiliated with the British organization. A deputation of workers from the association in conference with the ministry of health requested that contraceptive advice be given by physicians, when necessary, at state maternity hospitals.

Puerto Rico.—With the legality of contraceptive advice, under medical direction, established in Puerto Rico by legal decision in 1939, clinic services have been established under the supervision of the Puerto Rico board of health. The Associacion pro Salud Maternal e Infantil de Puerto Rico, under the medical direction of Dr. J. S. Beleval, continued its educational and research efforts to determine the type of contraceptive best adapted for use on the island. Public interest in the medical and public health aspects of birth control were stimulated by a visit from Mrs. Sanger in 1940 and the medical films on contraception were being widely shown among scientific and medical groups.

Sweden.—The new population measures instituted in Sweden which went into effect Jan. 1, 1938, based on the principle that voluntary parenthood and a positive population policy must be brought together, were in their second year. This policy emphasizes that only children welcome to their parents are wanted by the nation; but it also recognizes that certain social conditions must be rearranged so that more children can be welcomed. Birth control services were widely extended to reach all groups of society, but to reduce the economic motive for extreme family regulation, a series of measures, involving not cash premiums to parents but health and environmental services benefiting the children themselves, were put into effect. Hence skilled labourers and artisans in Swedish cities are having more children than the unskilled. It is to be hoped that the war will not destroy Sweden's interesting and historic experiment.

United States: Clinics.—The growth of birth control centres in the United States continued. On Nov. 1, 1940 these totalled 589, of which 106 were in hospitals, 178 in health departments and 305 in other quarters, largely extramural. Of these centres, 206 were supported wholly or in part by public funds.

Human Fertility.—In Jan. 1940 the *Journal of Contraception*, published by the medical department of the Birth Control federation, changed its name to *Human Fertility*, as more truly expressing its contents.

Field Work.—Representatives of the Birth Control Federation of America, Inc. co-operating with various health agencies, extended birth control services to underprivileged mothers in 11 states not yet ready to undertake state-wide programs under their health departments. The services were medically supervised and simple contraceptives were advised.

U. S. Population Policies.—Wide attention was given to a report by the Population committee of the National Economic and Social Planning association which advocated "Provision for scientific information concerning appropriate methods of contraception for all potential parents is an essential measure for sound population policy."

Special Negro Project.—The federation, through a special grant of funds, established a division of Negro service, sponsored by a National Advisory council which included Negro leadership in all fields. Two special Demonstration projects were established, one in Nashville, Tenn. and one in Berkeley county, S.C., to study the effects of medically directed contraception upon the health and welfare of the Negro populations of those sections. The Urban project in Nashville is under the direction of the City Health officers and the Rural project will be supervised by the chairman of the Committee on Maternal Welfare of the South Carolina State Medical association.

Legal Action.—The Federal Trade commission was active during 1940 against false claims for a number of commercial contraceptives. Cease and desist orders were issued against some and suits instituted against others. Such government action was welcomed by the organized movement for birth control, as a step in regulation of the bootleg traffic in undependable contraceptives.

Legal Decisions: Connecticut.—On March 21, 1940, the Supreme Court of Errors of the State of Connecticut, by a vote of 3 to 2, handed down a decision patterned on that in Massachusetts in 1938. The Connecticut decision upheld the existing statute and ruled that under it, it was illegal for a physician to prescribe, or a patient to use, contraceptives, even where definite medical indications existed. Connecticut is now one of the only two states in the Union where a doctor is forbidden to advise a patient on contraception and remains the only state where the *use* of contraceptives is illegal.

Iowa.—A decision in a suit brought against a druggist in Iowa, in 1937, was handed down by the supreme court of that state in 1939. The druggist was accused of violating the law by distributing a pamphlet entitled "Birth Control." The court ruled him not guilty because the code of laws of the state specifically exempted medical schools, physicians and druggists from the provisions of the act governing distribution of contraceptive literature or materials.

Massachusetts.—While previous court decisions declared it illegal for a physician to give contraceptive information under any conditions, the decision of the Massachusetts supreme court, Sept. 17, 1940 by a vote of 3 to 1, reversed a former ruling and declared a pharmacist not guilty in selling certain articles for the prevention of conception because there was no proof they were to be used for the prevention of conception. This decision added to the existing legal confusion in Massachusetts, making it possible for bootleg traffic in questionable contraceptives to flourish, while legitimate medical contraceptive service remained outlawed. An Initiative Petition distributed by the Massachusetts Mothers Health council to amend the statutes involved was filed with over 45,000 signatures, though only 20,000 were legally required.

State Birth Control Federations.—There are now 32 organized state birth control organizations co-operating with the Birth Control federation. D. Kenneth Rose became executive vice-president of the federation in 1940 and Woodbridge E. Morris, M.D., former director of the division of Maternal and Child Health of the Delaware state board of health became general medical director. (M. Sr.)

Birth Statistics. Provisional reports show that there were 2,262,726 births in the United States during 1939 and that the birth rate was 17·3 per 1,000 total population. Canada, in 1939, recorded 229,063 births and had a birth rate of 20·3 per 1,000. In the same year there were 620,257 births in England and Wales, the birth rate being 15·0 per 1,000. White persons in the United States in 1938 had a birth rate of 17·2 per 1,000, while that for Negroes was appreciably higher, namely 20·9 per 1,000.

Birth rates for the principal countries for the latest year available are shown in the appended table. Countries with birth rates as low as 16 per 1,000 or less are: Belgium (15·6 in 1938); England and Wales (15·0 in 1939); France (14·6 in 1938); Norway (16·0 in 1939); Sweden (15·3 in 1939) and Switzerland (15·2 in 1939). Most of the countries with birth rates of 20 per 1,000 or less are in western Europe. Birth rates are still high in many countries of South America and Asia. Thus, countries with birth rates of more than 30 per 1,000 are: Chile (35·2 in 1939); Colombia (32·1 in 1938); Venezuela (36·9 in 1939); Mexico (40·4 in 1939); British India (34·1 in 1938); Palestine (38·1 in 1939) and Egypt (43·4 in 1938). Birth rates as high as these would undoubtedly be found in many populous countries which have no adequate system for recording births. It has been generally observed that countries with high birth rates also have high death rates (*see* Death Statistics) and high infant mortality (*see* Infant Mortality).

Annual Birth Rates per 1,000 Total Population in Certain Countries for 1939 and for Each Year in the United States from 1915 to 1939 and in England and Wales from 1900 to 1939

Country	Birth Rates per 1,000 in 1939	Year	Birth Rates per 1,000	
			United States (b)	England and Wales
North America		1900	..	28.7
United States	17.3	1901	..	28.5
Canada	20.3	1902	..	28.5
Mexico	40.4	1903	..	28.5
South America		1904	..	28.0
Argentina	24.0			
Chile	35.2	1905	..	27.3
Colombia	32.1(a)	1906	..	27.2
Uruguay	19.8(a)	1907	..	26.5
Venezuela	36.9	1908	..	26.7
Europe		1909	..	25.8
Albania	27.7			
Austria	20.9	1910	..	25.1
Belgium	15.6(a)	1911	..	24.4
Bulgaria	21.4	1912	..	24.0
Czechoslovakia	16.8(a)	1913	..	24.1
Denmark	17.8	1914	..	23.8
Eire	19.1			
England and Wales	15.0			
Estonia	16.3	1915	25.1	21.8
Finland	19.9(a)	1916	25.0	21.0
France	14.6(a)	1917	24.7	17.8
Germany	20.3	1918	24.6	17.7
Greece	25.9(a)	1919	22.3	18.5
Hungary	18.9			
Ireland, Northern	19.5	1920	23.7	25.5
Italy	23.4	1921	24.2	22.4
Latvia	18.5	1922	22.3	20.4
Lithuania	22.3	1923	22.2	19.7
Netherlands	20.7	1924	22.4	18.8
Norway	16.0			
Poland	24.5(a)			
Portugal	26.5	1925	21.5	18.3
Rumania	28.3	1926	20.7	17.8
Scotland	17.4	1927	20.6	16.7
Spain	19.2(a)	1928	19.8	16.7
Sweden	15.3	1929	18.9	16.3
Switzerland	15.2			
Yugoslavia	26.7(a)	1930	18.9	16.3
Asia		1931	18.0	15.8
India, British	34.1(a)	1932	17.5	15.3
Japan	26.7(a)	1933	16.6	14.4
Palestine	38.1	1934	17.2	14.8
Other Countries				
Australia	17.7	1935	17.0	14.7
Egypt	43.4(a)	1936	16.8	14.8
New Zealand	18.8	1937	17.1	14.9
Union of South Africa		1938	17.6	15.1
(Whites)	25.4	1939	17.3	15.0

(a) Birth rate for 1938.
(b) Official data begin with 1915. For years prior to 1933, the birth rates relate to an expanding area within the United States.

Within the United States, the birth rates are highest in the southwest and lowest in the northeast. Thus, New Mexico in 1939 had a birth rate of 27·3 per 1,000; Arizona, 22·2; Utah, 23·9 and Mississippi, 23·8; while New Jersey had 13·6, Connecticut 13·8, Massachusetts 14·7 and New York 14·1.

The rapid decline in the birth rate which most western countries have been experiencing for several decades now appears to have been halted.

Thus, the birth rate in the United States has been hovering at a level of about 17 per 1,000 in the period since 1932; at the same time, the birth rate in England and Wales has been fluctuating about a rate of 15 per 1,000. On the other hand, the birth rate in Germany has moved up rapidly from a low point of 14·7 per 1,000 in 1933 to 20·3 in 1939. This is undoubtedly the result of measures undertaken by the National Socialist regime of that country to stimulate marriages and large families. However, the countries engaged in the European war will undoubtedly experience low birth rates in 1940.

When birth rates are computed as a rate per 1,000 women of a given age in the population, they are then known as age-specific fertility rates. Thus, for white women in the United States in 1938, the fertility rates per 1,000 were: ages 15 to 19 years, 42·8; 20 to 24 years, 123·0; 25 to 29 years, 112·0; 30 to 34 years, 75·2; 35 to 39 years, 43·6; 40 to 44 years, 14·7 and 45 to 49 years, 1·4.

An analysis was made of the trend of age-specific fertility rates in the United States for the period from 1920 to 1938. It was found, in the first place, that the fertility rate for women of ages 15 to 19 years showed a greater stability than at the higher ages. Before 1926, the fertility rate was at a maximum in the age group 25 to 29 years, but, since then, the maximum has been in the age group 20 to 24 years. Fertility rates for each of the age groups 15 to 19 years, 20 to 24 and 25 to 29 reached a minimum in 1933 and then showed a tendency to move upward. This tendency was very marked in the age group 20 to 24 years. However, the fertility rates for each of the quinquennial age groups after age 35 continued downward, with only occasional interruptions from 1920 through 1938.

A report showed that one-eighth of the births in the United States during 1935 were without medical attention; however, nine-tenths of the births without medical attention were attended by midwives. (*See* also CENSUS, 1940.)

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Blitzkrieg: *see* LIGHTNING WAR; STRATEGY OF THE EUROPEAN WAR.

Blockade. Blockade is, in its generally accepted usage, the process by which a belligerent controls the ingress and egress of trade to a belligerent. It may involve control of neutral ships bound for neutral ports wherein the doctrines of "ultimate destination," "ultimate consumption" or "substitution" are involved. International law does not recognize a blockade as legal unless it is rendered effective by force. Furthermore, by law, a blockade must be effective in order to be binding. A "paper" or ineffective blockade has no legal status in the law of nations. Strict interpretations of law were soon disregarded in the World War of 1914–18 and in 1940 the law of nations was more honoured in the breach than in the observance. The rights of visit and search, seizure, and contraband cargo were closely associated with the practice of blockade.[1]

In early days, blockade was maintained by a close blockade and reached its perfection in the wars of Great Britain against the French revolutionary governments and those of the French empire. The blockade of the south by the northern navy in the American Civil War was a major factor in the outcome of that war. The maintenance of an effective sea blockade by Great Britain of Germany from 1914 to 1918 literally starved the civil populace of the Central Powers and did much to effect an Allied victory. Great Britain had in 1940 the stupendous task of attempting to maintain a blockade of practically all the continent of Europe. It was the largest scale operation British sea power ever attempted in its long history, for the British fleet was confronted with strong air power and aggressive submarine warfare based on nearby continental ports.

In time, the close blockade of other days was challenged by the advent of new weapons, the mine, torpedo and submarine. In the war of 1940, the aeroplane was another new weapon that fought surface craft both in the close and long distance blockade. In fact, the tactical or close blockade was seriously questioned as to its effectiveness after the Russo-Japanese War, when Admiral Togo, the Japanese admiral before Port Arthur, lost two battleships by mines. This was one-third of his major force and forced Togo to relinquish his tight grip on the port. The first long range naval blockade was instituted at the outbreak of the World War of 1914–18, and with modifications was the type employed by Great Britain in 1940. Britain, Dec. 1940, maintained a long range strategical blockade with surface vessels, a close blockade when possible with submarines and employed bombers to destroy docks,

[1]All assertions or opinions contained in the above article are the private ones of the writer and are not to be construed as official or reflecting the views of the navy department or of the naval service at large.

jetties and harbour facilities that could be used by Germany and Italy. After the fall of France, capital ships were also used on occasions to bombard ports held by Germany and Italy. Although a long range blockade existed in 1940, the change in the military-naval situation effected by the German occupation of North sea, English channel and Atlantic ports forced the royal navy to weaken its blockade in order to detach ships for other duties.

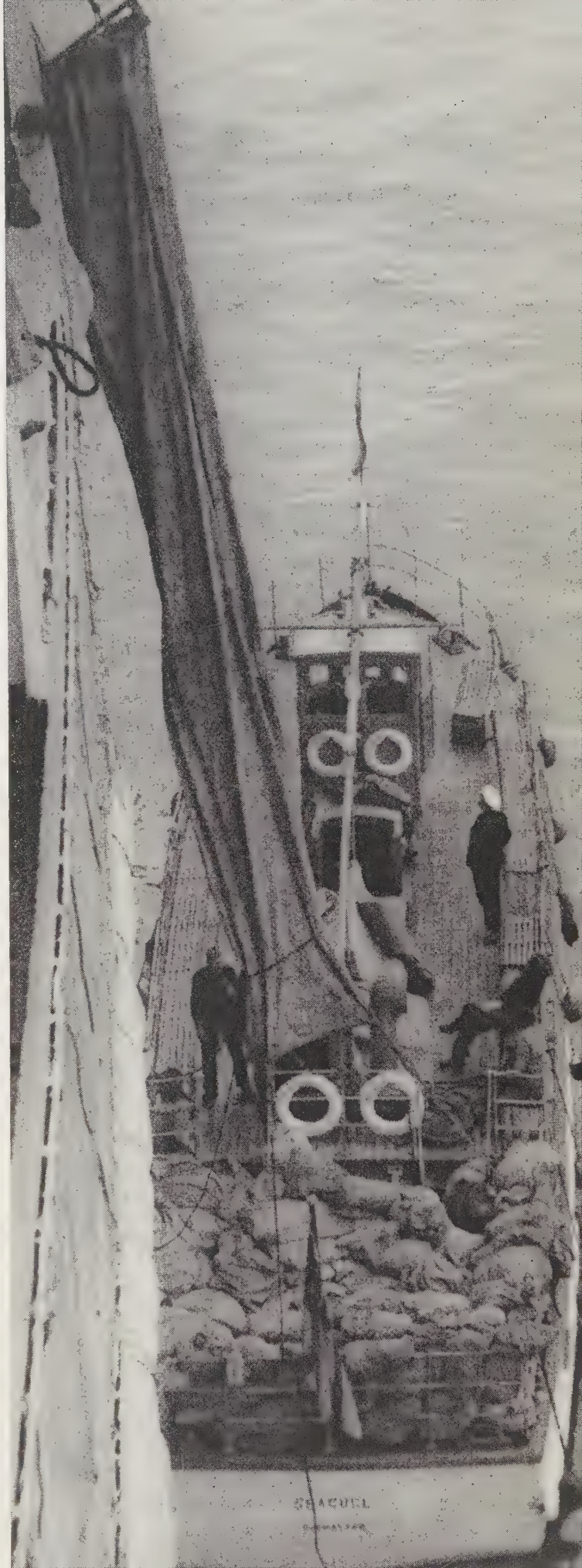
British sea power at the outbreak of the war commenced to exert an economic pressure by blockade that has been defined as "an act of war carried out by the warships of a belligerent detailed to prevent access to or departure from a defined part of the enemy's coast." The British Isles occupy a favourable position to permit her superior sea power to control and dominate the lines of sea communication bordering on the North sea and the channel ports. But with the fall of Norway, Denmark, the Low Countries, and German control of leading French ports, the British Isles have been forced to meet German sea and air power at short range. This changed situation affected the British blockade of the continent because of the sea and air force that she was compelled to mobilize in proximity to the British Isles to meet a threatened German invasion. This counterblockade by mines, aeroplanes, submarines and torpedo motor boats on the part of Germany rendered the British blockade less effective but the royal navy and the royal air force maintained the blockade and patrol to a surprising degree.

The British patrol and blockading squadrons went on stations Sept. 3, 1939. Great Britain did not declare a formal blockade but issued on Sept. 3 a proclamation of lists of contraband that covered practically all imports to Germany. The term "blockade," as used in 1914 and in 1940, is technically wrong in a strict legal interpretation because in its present usage it denotes the machinery employed to bring economic pressure on the enemy. On Sept. 9, 1940 the British government stated that "to prevent contraband from reaching the enemy, His Majesty's government will use their belligerent rights to the full."

Blockade, or the control of neutral shipping to enemy ports or contiguous areas, requires a highly organized machinery in the modern accepted version of "economic warfare." Before the World War of 1914–18, neutral ships were searched for contraband by blockaders at sea. Under modern conditions of war, with enemy submarines at sea, Great Britain found it exceedingly dangerous to stop men-of-war at sea for the purpose of examining the cargoes of merchantmen. In the World War, vessels suspected of carrying cargo that would reach Germany even indirectly were sent to designated British ports for inspection. Such ports are called control ports. For example 48 neutral ships were held on Dec. 26, 1939, at three contraband inspection ports in the United Kingdom. Since there is scarcely any shipping to the once neutral European countries now occupied by Germany, the control ports have lost much of their importance within the year 1940.

At the beginning of the war in 1939, Great Britain inaugurated the ministry of economic warfare with a complete staff from the civil service ready to function in a few weeks. This department was called in 1915 the ministry of blockade. All contraband comes under the admiralty marshal until a prize court sits and decides the ultimate destination.

Neutral ships may receive from British control ports and authorities in large neutral ports navigation certificates, called "navicerts," which attest that the cargo is free of contraband. "Navicerts" provide a means of obviating inspection when ships are boarded by British blockaders on the high sea. It is a "pass" through the blockade.



BRITISH SEIZURE of 235 bags of mail aboard the U.S. liner "Manhattan" at Gibraltar Jan. 7, 1940, provoked a sharp note of protest from the department of state

On April 9, 1940, Germany occupied Denmark and commenced the occupation of Norway. This had a serious effect on the British blockade of that area. On May 21, Germany began to occupy French channel ports and thereby pushed their bases closer to the British blockading squadrons. This marked the beginning of an effective counterblockade that continued throughout 1940. In Aug. 1940 Winston Churchill told the house of commons:

"It is our intention to maintain and enforce a strict blockade not only of Germany, but of Italy, France and all other countries that have fallen into the German power.

"There have been many proposals founded on the highest motives that food should be allowed to pass the blockade for the relief of these (conquered) populations. I regret that we must refuse these requests."

The refusal of the British government to permit food deliveries of Red Cross or other organizations to the people of Europe under German domination remained the policy in Dec. 1940. The British maintained that any relaxation of the blockade to permit passage of sea carriers with food for the ravaged lands of Europe would greatly assist the axis cause. Experts predicted that a near famine would prevail in parts of Europe for the winter of 1940–41. To achieve famine and hunger is the ultimate goal of a blockade for thereby the morale of a starving nation at arms may be undermined. A successful blockade hastens the decision; thereby does sea power with its air arm exert maximum pressure for victory.

Churchill's statement was a reply to the official German declaration of Aug. 17, 1940 announcing a total blockade of the British Isles. The nazis in a strong denunciation of British sea warfare and protesting the British declaration that foodstuffs were contraband, continued:

"The Reich government, therefore, has now decided to retaliate in kind and to employ armed forces with the same ruthlessness against shipping around England. . . . The unsuccessful British attempt to starve German women and children through a hunger blockade is answered by Germany with the complete blockade of the British Isles here proclaimed."

In 1915, the economic blockade enforced by superior sea power began to take effect on Germany. This hastened the first German declaration of submarine warfare which stated that from Feb. 18, 1915, onward, all hostile merchant ships met in British or Irish waters would be sunk without regard for the crew or passengers. Then, when the blockade by Britain grew more effective and the need in Germany for commodities and strategical war materials became pressing, the Kaiser on Jan. 19, 1917, issued the following order: "I hereby order unrestricted submarine warfare to be commenced on February 1st and to be prosecuted with the utmost energy." This declaration led directly to the torpedoing of American ships under the American flag which in turn so incensed public opinion that diplomatic relations with Germany were severed and in time the United States entered the World War. The United States then assisted in the blockade of the Central Powers, although on many occasions in the previous two years the United States had strongly objected to the seizure by the British and to condemnation of United States cargo consigned to neutrals near Germany.

In 1940, the British maintained combination blockading, bombarding and bombing forces. The blockading line was drawn perilously thin in some places in its long stretch from Iceland and northern Norway to Gibraltar. The royal navy held in 1940 a firm control of the Mediterranean. Major units remained concentrated in the search for Italian naval units. In Nov. 1940 a successful raid was carried out by a squadron of British ships on the Italian navy at Taranto, one Italian battleship was critically damaged while two more received hits that necessitated long overhaul periods. The damage was done by British sea-based aircraft. British naval strategy in the Mediterranean was to maintain as close a blockade as possible of Italy, bringing the Italian navy to action whenever possible. In a general sense the Mediterranean is blockaded as long as the British retain control of the important strategic positions of Gibraltar and the Suez canal.

Britain will continue to use sea and air power to crack the ax at its weakest link—Italy. Britain may in time move in to closer blockade of Italy. Only shore-based aircraft and subma rines prevented this in 1940. British soldiers were fighting wit the Greeks in Albania, while British airmen established air bas in Crete and Greece. The royal navy by the end of 1940 had sun or captured six of the seven Italian submarines based in the Re sea and was making every effort by blockade and patrol to preven supplies reaching Italian troops in Albania and northern Afric However, a German thrust to Gibraltar through Spain or to th Dardanelles through southeast Europe would seriously affect th grip of Britain on the Mediterranean. If the major portion c Italian sea power were destroyed, British cruisers and possibl battleships would be released for much needed convoy duty in th Atlantic.

The outcome of the war may well depend upon the tightnes and efficiency of the British blockade or the efficacy of th German counterblockade.

In counterblockade, Germany and Italy employ submarine aeroplanes, motor torpedo boats and surface raiders. All of th compels the release of British men-of-war for convoy duty. Th British Isles, always dependent upon sea-borne commerce, requi more foodstuffs and strategic raw materials in war than in peac The serious challenge to British shipping in 1940 compelled tha country to draw ships and planes from the blockading squadron to meet the menace as well as employ air power to bomb the Ge man occupied ports. To stop foodstuffs and war materials fro going to an enemy is the prime object of all blockade. Both Bri ain and the axis were in 1940 vigorously fighting to this end at se

What has been the effect of Britain's blockade of the Europea continent? There is no doubt that there was a lack of food an raw materials in Germany and Italy in 1940. Berlin reports we optimistic over the food situation although rationing was stricte there than in Great Britain. In Germany it was officially state that horse meat and dog meat would be official foodstuffs. Th reich also experienced a shortage of steel and strategic ra materials. The oil deficiency, it appeared, would be relieved b the occupation and dominance of Rumania.

Italy felt the pinch in a definite shortage of oil and gasolin The axis powers will of course exchange commodities but it considered that Italy, with a lack of strategic war materials, ha greater cause for future worry if the British fleet retains contr of the Mediterranean.

The blockade, convoy duty and patrol of the waters of th world were in 1940 maintained by the British at a great cost an sacrifice in lives and ships. There have been sunk since the begir ning of hostilities in 1939 some 3,800,000 tons of British, Allie and neutral shipping up to Nov. 9, 1940. About 400,000 tons c British ships flying the man-of-war ensign have been sunk sinc the beginning of the war. Aside from the ships lost, the badl needed cargoes also go to the bottom. Sinkings rose from monthly average of approximately 200,000 tons to 400,000 ton

Merchant ship losses have been serious but not critical. Grea Britain, to a large extent, abandoned the English channel as merchant ship route to London as well as St. George's channel t western English ports and routed much cargo north of Irelanc In 1938, Britain, in a treaty with Ireland, gave up her naval base at Lough Swilly, Berehaven, and Cobh which means that convo vessels must go 200 to 400mi. farther for fuel and repairs. U to the close of 1940, Britain strictly respected Irish neutrality.

In order to counterblockade and destroy British ships, German for nearly a year effectively utilized magnetic mines. Th menace was met by invention of ship devices to neutralize th mine and the use of positive mine-sweeping measures. A seriou

threat to British sea power was brought under control. The Germans, using Brest and Lorient, France, as bases mined the approaches to the English channel. The channel itself is a "no man's land" for general shipping. Large calibre artillery, "Big Berthas" and "Big Toms," bombarded the shores from both sides. Because of mines, bombardment and repeated bombing attacks most of the channel ports were in shambles and could be used only by shallow draught vessels such as motor torpedo boats and small submarines. The Germans used Boulogne and Cherbourg in 1940 as ports for naval operations against British convoys and blockaders.

The aeroplane proved to be a valuable weapon in blockade and counterblockade. Britain used her air power to strike at German ports with military objectives such as factories, shipyards and shipping. The Germans made reconnaissance of British shipping with planes and then sent bombers or submarines to make the attack. This co-ordination of weapons was a major reason for the rise in British tonnage lost. The grim war of attrition continued with Great Britain making urgent requests on the United States for planes, supplies and ships.

In past wars Britain could blockade countries in Europe and still trade for important commodities with neutral countries of the continent. In 1940 this was not so because of German occupation of much of Europe. Britain was compelled to go to South America or North America for much needed bauxite, iron ore, copper, wood, nickel, tin, cheese, fats and eggs. This required long voyages, convoys and escort ships for protection. But as long as Britain can maintain command of the sea, hold her bases and keep her homeland free of the foe she will remain a formidable power.

In short, superior sea power and one of its most potent manifestations, the blockade, was in 1940 holding its own. The royal navy and the royal air force stood between the British empire and defeat. If and when Britain attained a measurable air superiority over her enemies then the sea blockade would be definitely more effective.

Germany had by the close of 1940 "taken over" more countries for economic and strategic reasons and indicated a thrust to the near east for the purpose of securing control of the eastern Mediterranean and Britain's "life line of empire," the Suez canal. If the axis powers could secure the near eastern oil fields and the foodstuffs of North Africa then the British blockade of the European continent would be practically hopeless. But, at the close of 1940, in a careful survey of the effectiveness of the two blockades, the advantage went to Great Britain. (*See* also EUROPEAN WAR; INTERNATIONAL LAW; SHIPPING, MERCHANT MARINE.)

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Blood, Sir Bindon (1842–1940), British general, was born in Cranaher, Ireland, Nov. 7. He enlisted in the royal engineers in 1860, saw active service in Africa and India, and was associated with Gen. Gordon in the Egyptian campaign of 1882. During the South African War he was promoted to the rank of lieutenant general. He was a Knight Commander and Knight Grand Cross of the Order of the Bath and a Knight Grand Cross of the Royal Victorian order. He died in London, May 16.

Blumer, George Alder (1857–1940), U.S. psychiatrist, was born in Sunderland, England, May 25. He studied in England, Scotland, Germany and France before going to the United States, where he was graduated from the medical school of the University of Pennsylvania in 1879, becoming at once a resident physician at Lankenau hospital in Philadelphia. He served there a year, then went to the State Hospital for the Insane in Utica, N.Y., as assistant physician. He was made superintendent in 1886. In 1899 he was transferred to the Butler hospital in Providence, R.I., and remained there until his retirement in 1922. Dr. Blumer did much to bring about humane treatment of the insane. He was an honorary member of the Royal Medico-Psychological association, the Society of Mental Medicine of Belgium and the Medico-Psychological society of Paris, and was a corresponding member of the Society of Psychiatry of Paris. He died in Providence, R.I., April 25.

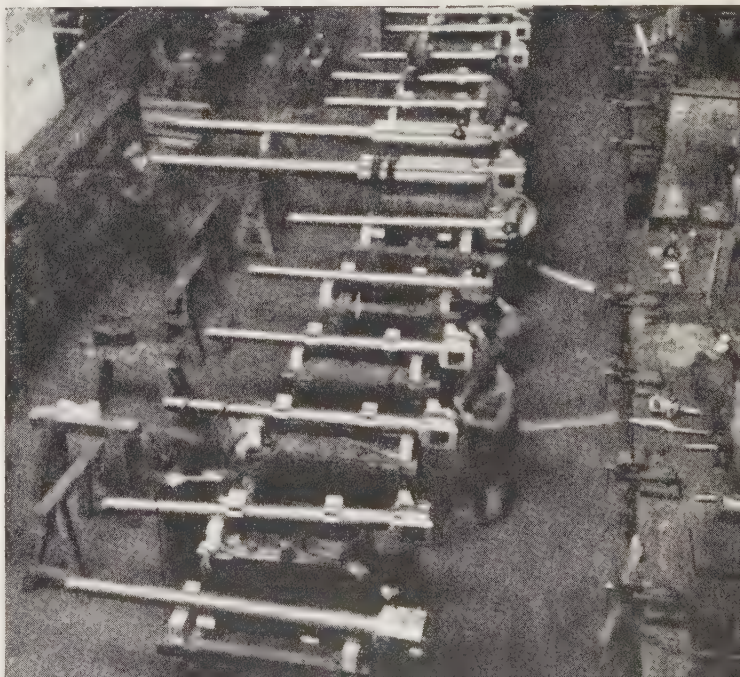
Bock, Fedor von (1880–), German soldier, was born Dec. 3 at Kuestrin, near Berlin, and was educated at the Potsdam Military school. At the age of 17 he was assigned to an infantry guards regiment. He had advanced to a captaincy by the time of Germany's entry into the World War in 1914 and emerged from the war as a major.

In 1919 he became commander of the Peace army and in 1920 commander of the third army group, which post he retained for 18 years, until his appointment by Hitler as commander of the first army group in 1938. During the invasion of France in May and June, 1940 he commanded the lower Somme army group. He was one of the 12 German generals created field marshals of the reich by Hitler on July 19.

Boëx, Joseph H. H.: *see* ROSNY, JOSEPH HENRY.

Bohemia and Moravia. These two former provinces of Czechoslovakia (*q.v.*) have been a protectorate of the German reich since March 16, 1939. Bohemia has an area of 12,525 sq.mi., with a population of 4,472,354, Moravia an area of 6,533 sq.mi., with a population of 2,332,522. The vast majority of the population is Czech; however, there is a tiny minority of Germans which is increasing through the influx of German officials, soldiers and settlers from the German reich. The religion of the people is mainly Roman Catholic. The real government of the country was in 1940 in the hands of a representative of the German government, the Reichsprotector, Baron Constantin von Neurath, but a puppet government of the Czechs still existed under state President Emil Hacha.

GUN BARRELS large and small were manufactured in 1940 for the German army by the huge Skoda munitions plant in former Czechoslovakia



The war separated Bohemia and Moravia from all contacts with the outside world. The process of Germanization was speeded, the local administration was stripped more and more of its remaining powers, the anti-Semitic legislation was tightened, but at the same time the resentment of the Czech people grew, and they continued as far as possible their policy of passive resistance, centring their hopes upon the Czechoslovak government, which under the leadership of Dr. Eduard Beneš was formed in the fall of 1940 in Great Britain. The national socialist administration tried to promote the small Czech fascist group called *Vlajka,* but its influence remained very limited. In spite of all kinds of persecution the Czechs remained attached to the national solidarity party which represented the unified Czech nation. While Bohemia and Moravia continued until Sept. 15 as a separate economic unit, on that day they were incorporated into the German Customs union. Their whole economic life had by then been co-ordinated with the German economic life, of which they became an integral part.

(H. Ko.)

Bolivia, a South American inland republic on the southern Andean plateau; language, Spanish; capital, La Paz; president, General Enrique Peñaranda; area, 419,470 sq.mi. The population (1938 official estimate) is 3,398,000; Indians comprise over half, whites around an eighth. The chief cities (with est. pop.) are: La Paz, 202,000; Oruro, 45,000; Cochabamba, 37,000; Potosí, 35,000; Sucre, 32,000.

History.—Bolivia was politically unstable throughout 1940, although tension lessened as economic conditions improved late in the year. In the March 15 presidential elections, General Enrique Peñaranda was elected to succeed provisional President Carlos Quintanilla, who had served since Aug. 1939. He received nearly 80% of the approximately 75,000 votes cast in the entire country. On March 26 a revolutionary coup sought to prevent Peñaranda's installation, but was quickly suppressed and the new president took office April 15. In May a general amnesty released all political prisoners. A further outbreak was quelled in July, but political unrest continued and a serious cabinet crisis occurred in November.

Some difficulties with "fifth columnists" were experienced during the year, and charges were openly made that several newspapers were being subsidized by totalitarian interests. The Peñaranda administration, however, co-operated with the United States and other American republics in promoting hemisphere solidarity. On April 2 a treaty with Argentina was signed, under which Argentina undertook to construct a 62-mi. railroad from her frontier to Villa Montes in the Bolivian oil fields, accepting petroleum in payment.

The Peñaranda administration was regarded as generally more conciliatory toward foreign interests than any regime in the previous decade. Foreign observers viewed with optimism the prospects for a settlement of the four-year-old dispute over cancellation of the Standard Oil Company of Bolivia's petroleum concessions. Better prices for tin and other metals as a result of war demands and an agreement in October under which the United States undertook to purchase 18,000 tons of tin annually for five years (1940–45) materially improved Bolivia's financial condition. Meanwhile, negotiations were under way for the establishment of tin smelters in the United States to handle Bolivian tin ore. On Oct. 5, President Peñaranda outlined steps to be taken in anticipation of resumption of payments to the U.S.A. on Bolivia's defaulted dollar bonds.

Education.—In 1940 there were more than 2,000 primary schools, with more than 150,000 enrolment, and three universities (La Paz, Sucre and Cochabamba).

Trade and Communication.—External communication was by rail to Peru, Chile and Argentina, and by Pan American Airways to all parts of the hemisphere. A 635-mi. railway from Santa Cruz to Corumbá, Brazil, has been under study and construction since 1937, with the eventual objective a connection with the Brazilian port of Santos. The project was lifted out of uncertainty by pledge of United States financial aid and formal endorsement by the Havana conference of a transcontinental railway from Santos to Arica (Chile) utilizing the Corumbá route. This, it was planned, would link several Bolivian and Brazilian lines and form the Bolivia-Arica railway into a unified system, thereby opening large hitherto inaccessible areas of Bolivia. Bids were asked and contracts let on several sections during 1940. The Bolivian highway system included nearly 900 mi. of Pan-American highway, some 4,500 mi. of other roads and an extensive additional mileage under construction.

Under European war influences, Bolivian exports in 1939 exceeded those of 1938 by 23·8 tons. Imports declined 5·9%, however. Exports and imports (expressed in bolivianos of 18 pence gold, or 36½ cents U.S.) totalled 117,399,540 bs. and 66,401,727 bs., respectively. Exports in the first half of 1940 ascended to 73,656,589 bs. Minerals accounted for 97·2% of all 1939 exports. Tin alone aggregated 70·1%.

Finance.—The monetary unit is the boliviano (value: approx. 2½ cents U.S.). On June 30, 1940 the external debt totalled $109,240,054, the internal debt $125,099,148. (L. W. Be.)

Bonci, Alessandro (1870–1940), Italian tenor, was born in Cesena and studied for five years at the Liceo Rossini in Pesaro . He made his operatic debut at Parma as Fenton in *Falstaff* in 1896. He then sang in Leghorn and Milan and soon accepted offers to appear in St. Petersburg, Berlin, Vienna, Lisbon, Madrid and London. Following his first appearance in London in 1900 he sang in South America and Australia. Oscar Hammerstein engaged him to sing in the Manhattan opera house in New York city, where he first appeared on Dec. 6, 1906 in *I Puritani.* He joined the Metropolitan Opera company in 1908. He toured the United States as a concert artist in 1910–11 and in 1919–21 he sang with the Chicago Opera company. He was regarded as a rival of Caruso. The king of Italy made him a Commander of the Crown. He died in Milan, Aug. 10.

Bonds. Disturbed world conditions were responsible for a series of sharp extremes in U.S. investment markets during 1940. Despite the extraordinary nature of events, however, average levels of prices of most classes of bonds not only advanced to new high marks for recent years but in some cases rose to all-time record peaks. Many factors entered into the broad pattern for the year in this respect, but the basic reason for the broad upward trend was the same easy money situation that had prevailed since 1933, the swollen aggregate of funds available for investment in the hands of banks, institutions and individuals creating a mounting demand for funded loans, particularly those of the so-called "gilt edge" type.

Seemingly incongruous in this connection was the fact that despite increase during 1940 in financing operations to the most active pace in four years, trading in bonds in the general market shrank to the smallest total in 23 years, as reflected in transactions on the New York Stock exchange. Turnover in funded obligations of all classes on the big board during the period amounted to $1,669,426,250. This compared with $2,046,083,000 for 1939 and $4,098,696,000 in the record year of 1922. Much of the trading in bonds was in the so-called over-the-counter markets though, and those appeared to have been favoured with relatively better activity, stimulated to a considerable extent by the financing operations.

Refunding dominated the issuance of new securities during the year, as had been the case for the several preceding years, "new money purpose" borrowing being negligible. This mirrored the unwillingness of investors under such uncertain world and domestic conditions to put their funds in any but the comparatively riskless type of enterprise and the reluctance of management to incur new debts for any except the most urgent needs. According to one compilation, there were 440 individual new bond issues in 1940 for a total of $2,635,489,000, compared with 432 issues for $2,184,321,000 in 1939 and 695 issues for $4,879,141,000 in 1936, the highest immediately-preceding year. This was in addition to an additional amount of securities placed directly with institutional investors in private negotiations variously estimated at one-third to more than one-half of the total offered through the normal channels to the public.

Among the corporate divisions, the public utility industry held its leadership of the last few years, although its financing volume was the smallest since 1937. Stimulated by the expanding influence of the national defence program, although the effect was more psychological than actual, industrial financing increased substantially over the preceding three years. A bright aspect of the situation was the brisk resumption of general market funding by the railroad field. Conspicuous was the absence in 1940 of any foreign dollar financing in the United States, issues of this type accounting for $39,250,000 the year before. In United States government financing 1940 was notable for inauguration of the huge borrowing program of the treasury incidental to the defence program.

Price-wise, United States government loans climaxed a seven-year uptrend in 1940 by ending the period at their all-time tops. This was reflected in the shrinkage of the average yield of representative longer-term issues to 1·86% in December. This compared with 2·30% at the start of the year.

Corporate liens also attained their best levels in December, with the exception of industrials. The Dow-Jones composite average of 40 representative issues of all classes reached 91·01 on Dec. 12 and on the same day first grade railroad obligations reached 95·93. Secondary rails topped at 51·11 on Oct. 10 and utilities at 110·51 on Nov. 15. Industrials subsequently failed to better their peak of 108·85 made in January.

State and municipal bonds also set new high price records toward the close of the year. The altitude of quotations was indicated in the decline in the average yield to 2·18% on representative issues of 20 prominent cities of the country, as compiled by the *Bond Buyer*. Average yield on the obligations of 11 cities of the highest credit rating shrank to 1·84%.

Prominent in the year's developments affecting the bond market was the revival with increased vigour of the movement directed toward the elimination of tax-exemption on federal and civic issues, with indications at the close of the period that something definite would be done along that line in the not distant future. (*See* also BANKING; STOCK EXCHANGES.) (J. F. GR.)

Bonneville Dam: *see* ELECTRIC TRANSMISSION AND DISTRIBUTION; OREGON.

Bonus: *see* ADJUSTED COMPENSATION.

Book-collecting.

Bibliographical activity during 1940 accented categories rather than personalities. Ernest R. Gee's *The Sportsman's Library: A Descriptive List of the Most Important Books of Sport, American and English,* Dichter and Shapiro's *Early American Sheet Music* and Louis C. Karpinski's *Bibliography of Mathematical Works Printed in America through 1850* are typical of the trend of research. So, in only less degree, is Thomas J. Holmes's Cotton Mather bibliography, for Mather was an epoch and a philosophy as much as he was an individual.

Similarly representative is the new edition of *Incunabula in American Libraries,* edited by Margaret Bingham Stillwell. This thorough and comprehensive manual supplants a compilation published in 1919, when the stimulus supplied by Henry E. Huntington and others whose interests paralleled his own was making the collecting of early printed books popular in the United States. The earlier edition of this census listed 13,200 copies of 6,292 titles of pre-1501 books in private and institutional collections in the United States. The 1940 edition presents a schedule of 35,232 copies of 11,132 titles—an increase of 167% in number of volumes and of 77% in number of titles.

The new edition of the incunabula census was published under the sponsorship of the Bibliographical Society of America. This important accomplishment is typical of the vigour which has been infused into the society in recent years largely as the result of an increased membership recruited in the main from the ranks of younger collectors and younger booksellers, many of whom are alert and competent bibliographers in their own right. Time was, and not so far distant, when the terms bookseller and bibliographer were supposed to be, and generally were, mutually exclusive. There were, of course, such significant exceptions as Joseph Sabin of New York and P. K. Foley of Boston, whose researches survive them as enduring monuments.

Undisturbed by the bombs which have inflicted an undisclosed amount of damage on the British museum, the Library of Congress continued to develop the facilities of its own rare book collection. On April 1, Arthur A. Houghton, Jr., owner of one of the great U.S. private libraries, became curator of this collection, and on the same day Jacob Blanck, editor of *American First Editions* and *American Book Prices Current,* under the terms of a special foundation administered by the library, undertook the compilation of an exhaustive bibliography of juvenile books of 19th century United States. The library had previously and with elaborate ceremonies dedicated the Hispanic foundation as a practical contribution to a better understanding among the new world republics. Further proof of the fact that the Library of Congress is becoming, under the direction of Archibald MacLeish, one of the great repositories of world culture is evidenced in the accumulation of oriental books and manuscripts. Among other fields in which fresh activity was noteworthy was the library's poetry collection, headed by Joseph Auslander, assisted by Audrey Wurdeman and Kenton Kilmer.

The death of A. Edward Newton (1863–1940) on Sept. 29 can almost be said to have closed a collecting era. Newton was an inspiring link between the old school and the new. His classic *Amenities of Book Collecting,* first published in 1918, was the greatest stimulus to bibliophily ever written. (J. T. W.)

Booklist: *see* AMERICAN LIBRARY ASSOCIATION.

Books: *see* CHILDREN'S BOOKS; PUBLISHING; *see* also under AMERICAN LITERATURE; ENGLISH LITERATURE; FRENCH LITERATURE, etc.

Book Sales.

Westward bound books continued to cross the ocean, usually under dramatic circumstances whereof the story is not often to be told. One such incident, however, can be disclosed here. In 1938 Frank J. Hogan of Washington, D.C., later president of the American Bar association, bought in the U.S. what is regarded as the finest copy in existence of the Caxton *editio princeps* of Chaucer's *Canterbury Tales* (Westminster, 1475). A minor binding repair was necessary and Mr. Hogan took the book with him to London in 1939. He returned to the U.S., leaving instructions to have the book sent to him as soon

as the repair was made. The war broke out, and the English expert was reluctant to ship the volume. In the summer of 1940 the British bookman took his family to the United States, but first he cabled Mr. Hogan asking if he should also bring the Chaucer and if he should insure it. Mr. Hogan replied that if the bookseller were willing to entrust his family to the efficacy of the British convoy system, he himself was willing to risk the Chaucer's safe arrival uninsured. The whole party crossed in safety and the Caxton Chaucer was in 1940 one of the glories of the Hogan collection.

Many of Britain's dealers removed their stocks to the country with the advent of war. Others remained in London, housing their merchandise as best they might. The underground vault of one famous Pall Mall bookseller became a secure air-raid shelter. Several shops which were not so well equipped suffered varying degrees of damage. The establishment of Dulau & Co., well known to U.S. collectors, was destroyed by a bomb on Oct. 12, 1940, and Leslie Chaundy, a member of the firm, was killed.

In 1940, in anticipation of bombings to come, London bookmen decided to hold no auctions. When at first the bombings failed to materialize, an attempt was made to inaugurate an auction season. Then the bombers came and the idea was abandoned.

The most important New York sale of 1940 was the dispersal of the library of the late John Gribbel of Philadelphia (Oct. 30, 31, Nov. 1). The 810 lots realized $144,239. The high points of the sale were Robert Burns's own copy of *The Scots Musical Museum* (four volumes, Edinburgh, 1787–88–90–92), heavily annotated, including a holograph transcript in variant form of *Auld Lang Syne,* $15,500, and a presentation copy of the first (suppressed) edition of Lewis Carroll's *Alice's Adventures in Wonderland* (London, 1865), one of three known inscribed copies, $15,300.

An admirable example of the highly specialized library came on the market Dec. 4 and 5, 1940, when the William Mitchell van Winkle collection of the works of Frank Forester (Henry William Herbert) was sold. A first edition of *My Shooting Box* (Philadelphia, 1846) brought $1,300, and a copy of *The Warwick Woodlands* (Philadelphia, 1845) $800. This collection had served as the basis for the definitive Herbert bibliography (Portland, Me., 1936) by Mr. van Winkle and David A. Randall. (J. T. W.)

Booth, Ballington (1859–1940), Anglo-American religious leader, was born in Brighouse, England, July 28, the son of the Rev. William Booth, founder of the Salvation Army. He was educated at the Taunton Collegiate institute and the Nottingham Theological seminary. In 1885 he was sent to Australia to command the Salvation Army there. Two years later he was made commander of the army in the United States. In 1896 his father decided to transfer him to another command. He resisted and broke with the organization and founded the Volunteers of America, a rival organization of which he remained the head until his death in Blue Point, N.Y., Oct. 5.

Borah, William Edgar (1865–1940), United States senator from Idaho, was born in Fairfield, Ill., June 29. He was educated in the common schools of Wayne county, the Southern Illinois academy at Enfield, and at the Kansas State university. He was admitted to the bar in 1889 and practised at Lyons, Kan. for two years. In 1891 he went to Boise, Idaho, and devoted himself to his profession until he was elected to the senate in 1906. He was re-elected five times. He served as chairman of the following committees: foreign relations, Indian depredations, expenditures of the department of justice, interoceanic canals, education and labour. He opposed the entrance of the United States into the League of Nations and the Permanent Court of International Justice. He died in Washington Jan. 19. See *Encyclopædia Britannica,* vol. 3, p. 893.

Borates. Asia Minor, Italy, Argentina, Chile, Bolivia and Peru are all minor producers of borates, but are far outstripped by the 250,000 short tons of borax produced in the United States in 1939, of which 91,100 tons were exported. Borax is used in enamels for iron and steel, in glass and soaps, as a mordant in dyeing and tanning and in a number of minor uses. (G. A. Ro.)

Borneo, an island in the East Indies, is divided politically into the British protectorate of Brunei; the independent states of North Borneo and Sarawak, both under British protection; and Dutch Borneo.

British Borneo.—Area, total *c.* 72,000 sq.mi.; pop. (est. Dec. 31, 1938) *c.* 840,000. Petroleum and natural gas are produced in considerable quantities; in 1934 a concession was granted to the Anglo-Saxon Petroleum company to prospect in North Borneo, and operations are proceeding. Large areas have been taken for the cultivation of Manila hemp.

Brunei: 2,226 sq.mi.: pop. 36,561 (Malays 30,433); capital, Brunei Town; British resident, J. G. Black; ruler, H.H. Sultan Ahmed Tajudin.

North Borneo: c. 29,500 sq.mi.; pop. 302,174 (Chinese 53,000); capital, Sandakan; governor and commander-in-chief, C. R. Smith.

Sarawak: c. 50,000 sq.mi.; pop. *c.* 450,000 (Malays, Dyaks, etc., *c.* 350,000; Chinese *c.* 100,000); capital, Kuching; ruler, H.H. Sir Charles Vyner Brooke, G.C.M.G. (Rajah); language (official), English; religions, Mohammedan, Buddhist.

Production.—*Brunei,* 1938; petroleum 707,219 metric tons; natural gas 3,195,000,000 cu.ft.; cutch (export) 1,695 metric tons; rubber 1,259 metric tons. *North Borneo,* 1939 (exports): rubber 23,900 metric tons; copra 13,050 metric tons; sago flour 2,705 metric tons. *Sarawak,* 1939 (exports): benzene, kerosene oil and liquid fuel $10,705,282; rubber $15,384,928; gold $1,141,155; sago flour $1,572,181.

Overseas Trade.—*Brunei,* 1938: imports $2,821,799; exports $6,580,725. *North Borneo,* 1939: imports $6,498,292; exports $13,453,318. *Sarawak,* 1939: imports $26,173,420; exports $34,379,748.

Communications.—1938: roads, suitable for motor traffic: *Brunei* 102mi.; *North Borneo* 236mi.; *Sarawak* 101 miles. Railways open to traffic, *North Borneo* 125 miles.

Finance.—1938: Currency: Straits dollar ($1 = 2*s.*4*d.*)

	Brunei $	*North Borneo* $	*Sarawak* $
Revenue	1,179,979	3,286,831	4,261,899
Expenditure	1,476,725	1,861,373	4,272,140

Dutch Borneo.—Area: western district, 56,664 sq.mi.; southern and eastern district, 151,621 sq.mi.; pop. total (census 1930) 2,194,533. Government: under the governor-general of the Netherlands Indies.

Bosch, Carl (1874–1940), German chemist, was born at Cologne, Aug. 27. He devoted himself to the study of chemistry and became noted as the producer of natural products by chemical processes. During the World War of 1914–18 he perfected the chemical production of ammonia so that it could be manufactured on a commercial scale for use in the production of explosives. For this he received the Nobel prize in 1931 in conjunction with his colleague, Friedrich Bergius. He also produced synthetic gasoline and many other substances. When the German chemical industry was organized as a dye trust in 1925 he was made chairman of the board. Later he became president and general director. He died in Heidelberg, April 26.

Boston, seaport at the head of Massachusetts bay; capital of the state of Massachusetts, U.S. Population (1930) 781,188 (229,356 being foreign born whites): 1940 (U.S. census) 770,816. The city is ninth in population in the United States. Its metropolitan district (U.S. census), including 80 cities and towns, is fifth in population, (1930) 2,307,897; (1935) 2,385,465. The Democratic party predominates but municipal elections are non-partisan. The terms of Mayor Tobin and the 22 councilmen expire in Jan. 1942.

The Quabbin reservoir was opened and connected with the metropolitan water system. The Huntington avenue subway was practically completed. The United States weather bureau established a forecasting station at the Boston airport. The shipbuilding facilities of the metropolitan area make Boston an important re-armament centre. The Boston navy yard had contracts for 23 vessels. Plans were approved for extensive additions to the navy yard and the South Boston dry dock. The naval air base at Squantum was being greatly expanded. Bunker Hill village (1,089 dwelling units), the second housing unit in the $32,000,000 program of the Boston Housing authority was opened. The American Legion convention crowded the city. Over 2,000,000 spectators watched the 12-hr. parade of 100,000 legionaries (Sept. 23). President Roosevelt and Wendell Willkie made major campaign speeches in Boston.

The chief municipal problems were declining assessed valuations (24·8% since 1930) and increasing traffic congestion. Tax rate: (1939) $39.90; (1940) $40.60, on an assessed valuation of $1,483,234,500 (decline of $41,565,500). Net bonded debt (1939): $132,990,000. Daily traffic (1938): 257,000; (1940) increase of 12% (estimate).

Boston maintained 293 school buildings and 6,428 employees, including 4,611 teachers. Enrolment (1940): kindergarten to ninth grade 83,949 (declining since 1933); high school 31,332, special 5,010, teachers' college 156. There are 44 parochial schools. Enrolment (1940): elementary 28,000, high school 3,000.

Six of the 28 hospitals were tax supported. The 1940 Community fund raised by 200 institutions in the metropolitan area reached a net total of $4,512,011.42. The overseers of the public welfare (1940) expended $14,916,056.01. Cases for the week ending Dec. 14 were: dependent aid 11,643; dependent children 4,117; old age assistance 15,298; WPA employment 19,071. WPA earnings (1939) totalled $19,213,000. The Federal Food Stamp plan was introduced in November (24,000 families eligible). The police force numbered 2,412. Expenditures (1939): $5,881,909. Fire department employees totalled 1,526. Expenditures (1939): $4,023,880. Fire loss per capita (1935–39): $2.92.

Total bank resources exceeding $3,000,000,000 and the Federal Reserve bank (first district) make Boston the financial centre of New England. Bank clearings (1940): $12,106,585,000, a gain of 6%. Bank debits (Jan.–Nov. 1940): $13,855,000,000, a gain of 3·4%.

Boston is the chief U.S. wool market and an important fishing port. Wool receipts (1939): domestic, 233,106,000lb.; foreign, 91,619,000lb. Fish landed (1939): 295,353,381lb., value $8,007,425; (Jan.–Oct. 1940) 210,518,997lb., value $7,097,311, a 15·1% decline by weight and a 6·4% increase by value. Total commerce of the port of Boston (1939): 17,842,212 tons (of 2,000lb.), a gain of 13%; imports, 2,169,610 tons; exports, 428,999 tons; (Jan.–Nov. 1940) imports gained 10·6% in value; exports gained 30·9%. Calls of ships in foreign trade: (1939) 1,695; (1940) 1,387.

Wholesale establishments (1935): 3,330; employees 32,334; pay roll $60,753,000; sales $1,333,016,000. Retail establishments (1935): 10,649; employees 60,968; pay roll $65,746,000; sales $439,120,000. Manufacturing establishments (1938): 2,225; capital invested $222,167,918; stock and material $185,363,524; employees 54,160; pay roll $64,603,088; value of products $367,366,715; average weekly earnings (1939) $23.48. Indices (average 1925–27=100) read: manufacturing employment (1939) 74·3, (Jan.–Nov. 1940) 75·8; manufacturers' pay rolls (1939) 66·8, (Jan.–Nov. 1940) 69·6; department store sales (Jan.–Nov. 1940) 66·2, a gain of 2·1. Building permits (Jan.–Nov. 1940): $11,762,291, a gain of 44·4%. Sales of electricity (1939): (1929=100) 144·9. Meters (1939): electric, 261,635; gas, 190,191. Number of dwelling units (1940): 211,620; vacancies, 13,889. Boston elevated passengers (1939): 295,123,077. Automobile registrations (1939): passenger cars, 99,843; trucks, 19,918.

(S. J. McK.)

Bostwick, Lucius Allyn (1869–1940), U.S. rear admiral, retired, was born in Providence, R.I., Feb. 21 and was appointed to the United States Naval academy in 1886. He was commissioned ensign July 1, 1892, and rose to the rank of rear admiral June 8, 1923. While serving as commander of the battle fleet from May 1929 to June 1930, he held the temporary rank of vice admiral. During the Spanish-American War he served on the "Oregon," taking part in the battle of Santiago, July 3, 1898. He was at the Naval War college from 1904 to 1906 when he was ordered to sea, serving as executive officer or commander of different warships. In 1925 he became chief of staff of the commander of the United States fleet and on July 1, 1930, he became commandant of the 4th naval district where he served until his retirement. He died in Washington Jan. 14.

Botanical Gardens. There were in 1940 some 155 botanical gardens and arboretums in continental United States alone. The forming of an organization known as the American Association of Botanical Gardens and Arboretums (A.A.B.G.A.) took place on Oct. 22, 1940, at Cleveland, O., at the time of the convention of the American Institute of Park Executives (A.I.P.E.).

During 1940 New York Botanical garden made extensive rearrangements of, and additions to, plantings, improvements to buildings and facilities for research, published a two-volume work on Caricaceae (Mackenzie) and reached the 2,000,000th specimen in the herbarium. During the year Brooklyn Botanic garden had nearly 2,000,000 registered visitors and contacted many others through lectures. They maintained five exhibits at the World's Fair, one of which was 119 varieties of Japanese Iris. Doctor Arthur H. Graves reported progress in selecting hybrid blight-resistant chestnuts of quality and Dr. George M. Reed showed progress in developing disease resistance in plants and concluded that many of the forms of native Louisiana irises are varieties rather than species.

During 1940 Missouri Botanical garden carried on extensive improvements in the arboretum 35mi. southwest of St. Louis, Mo., created two new hybrid tropical water lilies, added 3,000 new specimens to the "Flora of Panama," and published a report on its years of study of lawn grasses for St. Louis and a comprehensive report on the *Wild Flowers of Missouri.* Arnold arboretum, Boston, Mass., had in 1940 about 2,600 species of plants on 150ac. in cultivation. Several hundred others were tried and discarded for some reason or other. New acquisitions of land in 1940 ran the acreage to 221.

University of Wisconsin arboretum in 1940 was developing and restoring a 100-ac. Wisconsin prairie in the centre of its 900-ac. tract. Department of botany, University of Chicago, used its Wychwood property at Lake Geneva, Wis., as an outdoor ecological laboratory and bird sanctuary. University of Washington arboretum propagated about 400 species and varieties of rhodo-

dendrons for planting in its rhododendron glen. The Holden arboretum, Cleveland, O., enlarged the following ecological plantings: Atlantic pitch pine barrens, Rocky mountain subalpine forest and North American bog units. Montreal Botanical garden developed or enlarged during 1940 the following units: ornamental perennial, economic, water and bog and children's gardens. Morton arboretum, Lisle, Ill., started a 40-ac. planting of best shade trees and 17ac. of seasonal fruits for attracting birds.

Up to the end of the year 1940 only four numbers of *Bulletin of Miscellaneous Information of Royal Botanic Gardens, Kew,* came to the United States. These dealt largely with systematic studies of tropical plants. (*See* also BOTANY; HORTICULTURE.) (W. C.)

Botany. Hybridization of wheat and rye to obtain the grain quality of wheat combined with the resistance of rye has been unsuccessful because the cross is difficult to make and when it occurs the hybrid is invariably sterile.

The extravagant claims made for the effectiveness of vitamin B_1 in increasing the growth of green plants have not been substantiated by later work. When care was taken to supply the plants with an adequate culture solution including the necessary minor elements, D. I. Arnon found no gains in dry weight due to the addition of vitamin B_1 to cultures of seedlings of tomato, cocklebur, cosmos and mustard.

S. Satina and A. F. Blakeslee use cells with *2n, 4n* and *8n* chromosome numbers to trace the contribution of germ cell layers in the formation of plant organs in periclinal chimaeras. Inner conducting tissue of the style, through which the pollen tubes grow, is formed largely from the epidermal layer. The second germ layer contributes more toward the formation of leaves, sepals and petals, while the third layer contributes more to the formation of anthers and pistils.

Using a Geiger counter, D. I. Arnon, P. R. Stout and F. Sipos measured the rate of absorption and translocation of radioactive (P^{32}) phosphorus. After 40min. newly-absorbed phosphorus was detected in the leaves and tips of tomato plants over six feet tall. Radiographs of leaves and fruit slices were made by placing the tissue on paraffined paper on sensitive non-screen X-ray films wrapped in black paper or tin foil.

By cultivation of excised anthers in nutrient solutions W. C. Gregory found evidence that "control of the chromosomes at meiosis is not vested entirely in the cells actually undergoing the divisions but results from interactions involving one or more necessary materials which are transported into the anthers from another portion of the plant."

L. Knudson exposed spores of *Polypodium aureum* to X-rays and induced the formation of prothallia with abnormal chloroplasts; these plastid types persisted during seven years of vegetative propagation. Certain types were transmitted to the sporophyte and reappeared in the gametophyte of the new generation.

Solanum rostratum Dunal, although without a definitely organized cuticle on its leaves, is, according to W. H. Horr and F. Dill, one of the most drought resistant plants in Kansas.

Treatment by L. P. Miller of growing tomato plants with chemicals such as ethylene chlorohydrin, *o*-chlorophenol, chloral hydrate and trichloroethyl-alcohol induced the formation in the living tissue of relatively large amounts of glycosides in which the added chemical was the aglycon and in which the sugar component was the relatively rare disaccharide, gentiobiose.

F. M. Turrell and D. E. Bliss noted that *Alternaria* can attack the unwounded fruit of the date only at a stage of development which coincides with the time when a water soluble phenolic derivative in the epidermis of the fruit becomes insoluble.

According to a report by J. S. Penny, dredging operations along the Delaware-Chesapeake canal have uncovered tons of lignitic and succiniferous wood from the upper cretaceous strata. Over 50 logs were studied. Genera were: Pityoxylon, Araucarioxylon, Brachyoxylon and Cedroxylon.

Evidence presented by B. K. Stewart of fossil flora of Creede valley, Colo., indicates that the dry grasslands, chapparal and forest types similar to those of today existed in this valley during late Tertiary time.

Photoperiodic control in Biloxi soybean, according to H. A. Borthwick and M. W. Parker, is transmitted through the leaves and the effectiveness depends upon the age of the leaf, the most effective stage being at the time the leaf reaches full size. The most active leaf, operating alone, is as efficient as all of the leaves acting simultaneously. The flower-forming stimulus moves readily either up or down the stem.

E. M. Long gave *Xanthium* leaves the proper light exposure to cause induction of a photoperiodic effect in them and then grafted the leaves to vegetative plants; the grafted leaves induced flower initiation in plants exposed to a continuous long light period.

Some subjects dealt with in papers on the program of the American Phytopathological society at its 32nd annual meeting in Philadelphia were: L. W. Nielsen, "Silver Sprays with Promising Fungicidal and Adhesive Properties"; W. D. Valleau, "Experimental Production of Symptoms in So-called Recovered Ringspot Tobacco Plants and its Bearing on Acquired Immunity"; F. Johnson, "Transmission of Viruses by the Parasitic Activities of Dodder"; S. J. P. Chilton, "Loss of Sporulation in *Colletotrichum Destructivum*"; R. U. Swingle, P. E. Tilford and C. F. Irish, "A Transmissible Mosaic of American Elm"; R. J. Acree, "Temperature as a Precision Factor in Chemically Distinguishing *Cronartium Ribicola* and *C. Occidentale*"; L. O. Kunkel, "Cure of Aster Yellows by Heat Treatments"; E. M. Hildebrand, "Mechanical Transmission from Currant to Tobacco of a Virus Identified as *Annulus Zonatus*"; S. L. Hopperstead and T. F. Manns, "Buds as a Factor in the Overwintering of Shot-Hole of Peach, *Phytomonas Pruni*"; A. G. Newhall, "An Undescribed Storage Rot of Celery"; C. C. Wernham and R. S. Kirby, "A New Turf Disease"; A. E. Jenkins, "*Asochyta Majalis* Identified on Lily of the Valley in the United States"; N. E. Rigler and G. A. Greathouse, "The Isolation of Fungicidal Compounds from the Root and Bark of *Citrus Aurantium*"; F. Hedges and H. Fisher, "Association of *Bacterium Phaseoli* and the Virus of the Common Bean Mosaic"; R. B. Harvey, "Fluorescence of Potatoes under Ultra-Violet Light for Detecting Ring Rot"; J. T. Barret, "A New Species of Spongospora in Roots of *Australis Cotus*"; V. K. Charles, J. N. Couch, J. G. Harrar and J. J. McKelvey, Jr., "A Fungous Parasite of Mealy Bug"; D. E. Bliss, "A New Species of *Ceratostomella* on the Date Palm." (*See* also BOTANICAL GARDENS; HORTICULTURE.) (F. E. DE.)

Boulder Dam: *see* DAMS; ELECTRIC TRANSMISSION AND DISTRIBUTION; WATER POWER.

Bourbon, Jean Pierre Clement Marie de

(1874–1940), duke of Guise and pretender to the throne of France, was born in Paris, Sept. 4, the son of the duke of Chartres. Until his cousin, the duke of Orleans, Bourbon pretender to the throne, died in March 1926, he lived quietly at his chateau in the department of Aisne. As he was next in line of succession he was compelled by law to leave the country. He went to Brussels, dividing his time between that city and his large estates in Larache, Spanish Morocco. He served in the French Red Cross during the World War of 1914–18. On Feb. 1, 1933, he made his first political statement, a proclamation addressed to war veterans, state employees and taxpayers, calling on them to choose between

"oppression, anarchy and socialism" and "authority, liberty and monarchy." The duke in Nov. 1937 made a direct appeal to the people to restore the monarchy as the only alternative to national disaster. Following the victory of Germany in 1940, the royalists renewed their activity in his behalf. He died in Larache, Aug. 26, and was succeeded as pretender by his son, the count of Paris.

Bourne, Jonathan, Jr. (1855–1940), U.S. senator, was born in New Bedford, Mass., Feb. 23, the son of a shipowner. After attending Harvard, he went to sea in one of his father's ships and was wrecked off the island of Formosa. The ship which rescued him landed him in Portland, Oregon. He studied law and was admitted to the Oregon bar in 1881 but within a year he turned his attention to business. He served three terms in the state legislature and was elected to the United States senate in 1907, serving until 1913. He was the author of the parcel post law and was active in the National Progressive Republican league which supported Theodore Roosevelt for the presidency in 1912. He opened an office in Washington after his term as senator expired and died in that city Sept. 2.

Bower, Bertha Muzzy (1871–1940), U.S. author, was born in Cleveland, Minn., Nov. 15, the daughter of Washington Muzzy. She was taken to Montana by her parents when a small child and in 1890 she married Clayton J. Bower. Her first novel of western life, *Chip of the Flying U,* was published in 1906 under the name of B. M. Bower. She wrote thereafter a novel almost every year. Her last, *The Singing Hill,* appeared in 1939. She died in Los Angeles, Calif., July 28.

Bowling. The games were played in 1940 on some 165,000 alleys in recreation centres, clubs, church houses, colleges, schools, etc., by 12,000,000 bowlers. They played once or twice a week from six to eight months during the year and spent nearly $300,000,000 for fees, dues, refreshments, apparel, etc.

The 40th annual American Bowling congress championships, held in Detroit, drew more than 30,000 bowlers from 731 cities, witnessed by 100,000 spectators during the eight weeks of competition. Although no A.B.C. scoring record was exceeded, the 1940 tournament gained the distinction of being the only one in which two perfect "300" games were rolled. A frame of 12 consecutive strikes was scored by George Pallage, of Akron, Ohio and Angelo Domenico, of Canton, Ohio.

The A.B.C. champions in 1940 were: Ray Brown, of Terre Haute, Ind., singles winner, with a score of 742; Herbie Freitag and Joe Sinke, of Chicago, with a total score of 1,346, won the doubles title for the 12th time; Fred Fischer, of Buffalo, N.Y., won the all-events title with a score of 2,001. (J. B. P.)

Boxing. Joe Louis dominated boxing through 1940, a contradictory year that saw greater activity than ever before among champions in most of the eight standard divisions known to the sport, the passing of many titleholders and, yet, a falling off in receipts.

Louis held to his 1939 standard in title defences. He faced four challengers and conquered them all. Yet he was not the most active titleholder. The palm for this went to Henry Armstrong, California Negro, who at one time in his career enjoyed the unparalleled distinction of holding three championships at one time—the featherweight, lightweight and welterweight championships. Incidentally, Armstrong was one of the titleholders toppled from eminence. He lost his welterweight championship.

Louis started the year by winning a 15-round decision over Arturo Godoy, sturdy Chilean, in Madison Square garden, New York. It was a divided decision after a bout in which Louis failed to add lustre to his reputation, principally because of a shortcoming he has never been able to overcome and, likely, never will. He generally appears to disadvantage against a boxer who fights out of a crouch. The gross receipts for the match amounted to $84,490, smallest for any Louis championship fight in New York. The champion followed this with a knockout over Johnny Paychek, Des Moines, Ia., challenger, on March 29 in Madison Square garden. The knockout came in 44 seconds of the second round of a one-sided bout from which the Finnish Relief fund realized a sum in excess of $7,000. Following this came Louis's major bout of the year, an outdoor struggle against Godoy staged at the Yankee stadium, New York, and ending in the knockout of Godoy in the eighth round, the battle being stopped after 1min. 24sec. of the eighth round.

It was Louis's 11th defence of the title and attracted gross receipts of $149,505, the year's biggest gate, yet far short of the largest gate of 1939, which was $347,870 at the bout in Detroit in which Louis knocked out Bob Pastor in 11 rounds. Louis's fourth title defence was staged in Boston, Dec. 16, when he knocked out Al McCoy in six rounds. This bout, first heavyweight title bout ever staged in Boston, was another disappointment from the standpoint of Louis's form. He was fighting another crouching challenger and encountered the old difficulties. Louis's fire, however, brought a swelling to McCoy's left eye which assumed such dangerous proportions the challenger's seconds refused to let him respond to the bell for the sixth round.

Through the year Louis earned $129,312, not as much as he earned for some of the battles in which he engaged while climbing to the top. The sum reflects the standard of challengers as well as the existing economic situation. His earnings for 1940 boosted Louis's gross earnings from the ring since the day in 1934 when he abandoned a labourer's berth in the plant of Henry Ford to follow a boxing career, to $1,722,908.

Armstrong gained distinction as the most active champion through six successful title defences before he lost his crown to Fritzie Zivic of Pittsburgh. Armstrong knocked out Joe Ghnouly in five rounds at St. Louis, Jan. 4; Pedro Montanez in nine rounds in Madison Square garden, Jan. 24; Paul Junior in seven rounds in Boston, April 26; Ralph Zanelli in five rounds in Boston, May 24; Paul Junior (again) in three rounds in Portland, Me., June 21 and Phil Furr in four rounds in Washington, D.C., Sept. 23 before being dethroned. He lost his title to Zivic in a blistering 15-round struggle in Madison Square garden Oct. 4, barely surviving the distance. Zivic engaged in three non-title bouts but did not defend the championship before the year ended.

Billy Conn, Pittsburgh boxer, retained his world light-heavyweight title in a single defence. He won a 15-round decision over Gus Lesnevich in Detroit, June 5. He ended the year signed to a contract for a 1941 fight against Joe Louis for the world heavyweight title. The middleweight division saw a double change of titles. Ken Overlin of Washington, D.C., gained recognition in New York when he won a 15-round decision over Ceferino Garcia on May 23. Garcia had previously defended the title in a ten-round draw against Armstrong in Los Angeles. Overlin twice defended the championship in 15-round bouts against Steve Belloise, New York challenger, winning a decision each time. The National Boxing association recognized Tony Zale of Chicago as middleweight champion on the strength of a victory he scored over Al Hostak in Seattle. Efforts to pair the rival title claimants were unavailing.

In the lightweight division Lew Jenkins of Stillwater, Tex., knocked out Lou Ambers of Herkimer, N.Y. in three rounds of a bout in Madison Square garden May 10, to become generally rec-

THE FACE OF JOE LOUIS displayed a rare expression during his fight with Arturo Godoy at New York city June 20, 1940. His knockout of Godoy in eight rounds was his eleventh heavyweight championship victory in three years

ognized as champion. He knocked out Pete Lello of Chicago in New York on Nov. 22 in two rounds in his only title defence. Prior to Jenkins' bout with Ambers, the National Boxing association had declared the title vacant and sanctioned a bout between Sammy Angott of Washington, Pa., and Davey Day of Chicago, as a title match. Angott won this battle in Louisville and became N.B.A. champion. Harry Jeffra of Baltimore won a 15-round decision over Joey Archibald of Providence, R.I., in Baltimore, May 20, to become world featherweight champion in New York and several other sections of the country. But Petey Scalzo of New York defeated Frankie (Kid) Covelli in Washington, D.C., in May, to gain recognition as N.B.A. featherweight champion. In the bantamweight class Lou Salica of New York, defeated Georgie Pace, Toronto, Can., 15 rounds, decision, in New York, Sept. 24 to gain undisputed possession of the world championship. The flyweight class, once one of the most popular in boxing, was entirely inactive.

Added to his championship defences was the distinction of Armstrong in a six-round knockout over Lew Jenkins July 18 at the Polo Grounds, New York, in a non-title bout. This bout attracted 23,306 persons and gate receipts of $111,486. Other outstanding developments involved Max Baer of Livermore, Calif., former world heavyweight champion. He knocked out Tony Galento in eight rounds at Jersey City, July 2, before 22,711 persons who paid receipts of $98,000 and on Sept. 26 Baer knocked out Pat Comiskey in 2min. 39sec. of the first round in a bout which attracted gate receipts of $68,575 in Jersey City and was refereed by Jack Dempsey, former heavyweight champion. Dempsey undertook a "come-back," but abandoned the project after disposing of three obscure opponents in bouts staged in July.

Amateur Boxing.—Amateur and collegiate boxing continued to enjoy wide popularity. Sectional, intercity and national tournaments aside from the city, state, district and national championships of the Amateur Athletic union increased activity in amateur boxing beyond that of previous years. The Eastern Intercollegiate association championship was won by Penn State college, retiring the trophy. The Eastern Intercollegiate conference championship title was retained by Bucknell university.

Europe.—Boxing abroad was at a standstill because of the war. There were instances, in what few bouts were held, where the principals were paid off in foodstuffs. A notable instance was furnished in a bout staged in Paris after the German occupation when one of the principals received a sack of potatoes and a bottle of wine, in addition to 100 francs. (J. P. D.)

Boys' Clubs of America, Inc.

Boys' Clubs of America, Inc., is a federation of 348 organizations which provide leisure-time activities under trained leadership for nearly 300,000 boys between the ages of 7 and 18. They are found chiefly in the congested high-delinquency districts of urban communities. Boys' clubs are non-sectarian organizations and welcome boys of all classes and creeds. Each organization within the membership of the Boys' Clubs of America is completely autonomous, but looks to the national organization for the stimulation and promotion of the Boys' Club movement, and program, personnel and finance services which would be difficult, if not impossible, to secure if left to the individual units.

Boys' Clubs of America, Inc., was organized in Boston on May 19, 1906. Its control is vested in a board of directors who are elected by vote of the representatives of the member organizations. Specific responsibilities are delegated to a professional staff and to an executive committee. The officers are Herbert Hoover, chairman of the board; William Edwin Hall, president; Thomas Chew and Frank S. Mason, vice-presidents; Albert H. Wiggin, treasurer; William Ziegler, Jr., secretary. The headquarters are at 381 Fourth avenue, New York city. The budget for the year 1939 was approximately $150,000.

Boy Scouts.

During 1940 the increase in membership of the Boy Scouts of America was 80,995 for the first nine months, bringing the total up to 1,421,945. During the first nine months of 1940 there were 1,847,061 boys and men participating in the Scout program. Since the Boy Scouts of America was first founded in 1910, through Sept. 1940, 9,412,638 persons have been associated with it.

In 1940 the Boy Scouts of America again actively participated in the New York and San Francisco world's fairs. A demonstration and service camp was again maintained and more than 175,000 visitors inspected the Boy Scout New York world's fair camp, where nearly 3,000 scouts camped while rendering service to the fair.

The 30th annual meeting of the Boy Scouts of America was held from May 9 to 10 in Oklahoma City, Okla. The theme of the meeting was "The American Way." Members attended from all parts of the country.

During 1940 the Boy Scouts of America joined with 15 other national organizations, under the auspices of the Citizenship Educational service, in issuing "A Call to All Americans," a statement developed to arouse all citizens to vitalize the ideals of American democracy. A program of action for strengthening and invigorating democracy was also launched, consisting of an inventory and roll call of scouting's strength, the development of the Scout Emergency Service corps idea, and preparation for the mobilization of Scouts and Scouters quickly to render service in case of disaster or emergency.

Great Britain.—During 1940 reports from Scout organizations

abroad were scattered and few because scouting in many countries has been forbidden by the totalitarian governments. Reports from the Boy Scout association in England, however, showed that British Scouts, in line with their motto *"Be Prepared,"* were meeting each new emergency and rendering splendid service as the war went on.

Following is a list of activities which have been carried out by Cubs and Scout troops since the outbreak of war in Great Britain. This list, though not complete, is a splendid record of work well done.

Air Raid Precautions.—Wardens; messengers, cyclist and motorcycle messengers; decontamination squads; telephone operators; miscellaneous orderly duties indoors at town halls, control centres, etc.; delivering calling-up letters to A.R.P. personnel; call-boys for A.R.P. personnel; driving A.R.P. personnel; policing air raid shelters; policing trenches; sandbag emplacements, etc.; sandbag filling and stacking; camouflaging buildings; blacking out public and private buildings; escort duties to female A.R.P. night staff; gas masks—assembling, fitting, distributing, repairing and disinfecting; distributing, repairing and making gas mask containers; making wardens' rattles; erecting A.R.P. shelters for the old and infirm; assisting householders with trench digging; supplying messengers to inform deaf of air raid warnings and "all clear"; guides to aged, infirm, mothers, children, new arrivals in black-out; patrolling during black-out and directing traffic; painting and lettering tin helmets; training civilian stretcher parties; pumping water from Anderson shelters; guides to meet reinforcements and conduct them to various parts of town.

Auxiliary Fire Service.—Firemen; messengers; guides; telephone operators.

Thames River Emergency Service.—Telephone operators; stretcher bearers; signallers.

Police.—Special constables; war reserve police; messengers; guides; helping with traffic, distributing notices.

Scouts also took part in hospital and first aid work, evacuation work, forestry work, agriculture, home guard and refugee work. (J. E. W.)

Brandy: *see* LIQUORS, ALCOHOLIC.

Branly, Desire Edouard Eugene (1844–1940), French physicist, was born in Amiens, Oct. 23. He began his professional career on the faculty of the Catholic institute in Paris with an imperfectly equipped laboratory. In spite of this handicap he devised a coherer which played an important part in the development of wireless telegraphy. When Marconi sent his first wireless message from England to France in 1899 he admitted his indebtedness to the work done by Professor Branly. Branly had exhibited his invention before the French Academy of Sciences in 1891 and was elected to membership in the academy. As his salary was too small to support him he studied medicine and practised it for 25 years to earn money to pursue his scientific experiments. He died in Paris, March 24.

Brauchitsch, Walther Von (1881–), German general, was born in Berlin on Oct. 4, the son of a general of cavalry, and was educated in the German capital. He entered a military academy and became a lieutenant in 1900. In 1912 he became an officer of the German general staff and he served in this position during the war of 1914–18. He was appointed inspector of artillery in 1932, and the following year he succeeded Marshal von Blomberg as commander of the East Prussian army district, which in 1935 was transformed into the 1st army corps. In 1937 he became commander of the 4th army group, and in Feb. 1938 after the "army purge" he succeeded Gen. von Fritsch as commander-in-chief of the German army. He personally directed the campaigns in Poland, the Netherlands, Belgium and France. For his military services to the reich he was singled out for special mention by Adolf Hitler on July 19, 1940, and, with 11 other generals, was raised to the rank of field marshal. In his Christmas message to the German troops Brauchitsch declared the English channel would protect Great Britain "only so long as it suits us."

Brazil, a republic in eastern South America and largest independent country in the western hemisphere; language, Portuguese; capital, Rio de Janeiro; president-dictator, Dr. Getulio Vargas.

Area and Population.—The area is 3,291,416 sq.mi., 7·5% greater than that of the United States. The boundary line is approximately 23,648km. in length, and touches every South American country except Chile. The population was officially estimated at 45,002,176 in 1939, and unofficially at 45,500,000 at the end of 1940. On Sept. 1, 1940, a comprehensive human and economic census of the entire country was begun. Publication of results of this census was expected during 1941.

The great bulk of the population lived on the coastal strip, but colonization in the interior was being pushed. The north, especially around Bahia, was largely negroid, with Indian elements in the Amazon basin. Italian, Portuguese, Spanish, German and Japanese immigration, in the order named, was especially heavy in the southern states. In 1939, 22,668 foreigners entered Brazil with intent to settle. The principal cities (with 1938 est. pop.) are: Rio de Janeiro, 1,848,758 (1940 est.: 2,000,000); São Paulo, 1,322,643 (1940 est.); Recife (Pernambuco), 529,863; São Salvador (Bahia), 381,919; Porto Alegre, 368,352; Belém (Pará), 309,238; Bello Horizonte, 208,177; Santos, 203,126.

History.—Brazilian history during 1940 was dominated by developments arising directly or indirectly from the European war. On Jan. 15 the Inter-American Neutrality committee, an outgrowth of the Panama conference of Sept. 1939, began its sessions at Rio de Janeiro, and studied measures to maintain the "safety zone" proclaimed by the Panama conference.

Fifth columnism in Brazil received considerable publicity, and charges were freely made that nazis in Brazil had a "slush fund" of over $1,000,000. Although numerous foreign schools were closed for violation of laws prohibiting teaching in foreign languages, and other anti-fifth column measures taken, Brazil's problem, in the opinion of many observers, was still serious at the end of the year.

Relations with Great Britain were, on the whole, good, especially since that country made extensive purchases from Brazil. In December, however, Brazilian indignation was aroused by three acts of the British navy, seizure of Germans from a Brazilian ship, removal of goods on a Venezuela-bound Brazilian ship when it touched at Port of Spain, Trinidad, and, finally, detention of the westbound Brazilian ship "Siqueira Campos" at Gibraltar. The last precipitated a bitter but small flareup, but the issues were satisfactorily settled in mid-December.

Brazil took part in the Spanish-Chilean diplomatic rift by taking over Chilean interests in Spain and refusing to surrender the refugees whose asylum in the Chilean embassy had brought on the dispute (*see* CHILE). Similar manifestation of Pan-American solidarity was made in June, when, after reportedly informing the Uruguayan government of fifth column plots against it, the Brazilian government sold Uruguay much needed military supplies (*see* URUGUAY).

The sincerity of President Vargas' Pan-Americanism was

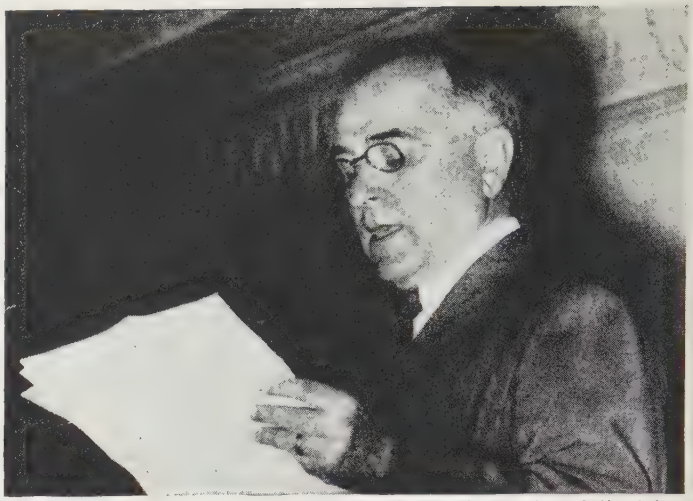
earlier called into question, however, when on June 11, immediately following Italy's formal entry into the European war, the Brazilian dictator, in a public speech, used language widely interpreted as praise for the axis powers and for totalitarianism. While critics cited earlier Vargas acts and policies as evidence of his pro-fascist personal feelings and the press of the democratic nations of America accused him of double-dealing, others regarded it as a sop to fascistic members of his own cabinet and to Brazilians of Italian and German descent. A few days later, to offset the hemisphere-wide unfavourable reaction, Vargas declared himself for Pan-American solidarity; subsequently, however, his continued reiteration of some of the ideas of his June 11 speech, interspersing them with laudations of Pan-Americanism and purging of fifth columnists caused some commentators to dub him the hemisphere's most adept tight-rope walker.

Despite Vargas' utterances, relations with the United States were increasingly friendly. Brazil lent strong support to the United States policies at the Havana conference, and acclaimed the United States-British destroyer-base deal of Sept. 2 (*see* West Indies, British). Reported negotiations for United States acquisition of bases in Brazil failed to materialize during the year, despite Brazil's extreme vulnerability to transatlantic attack. United States aid to Brazil was given most particularly through $25,000,000 in United States Export-Import bank credits.

Internal political instability was to a considerable measure due to economic depression, the outgrowth of the long-continued low price of coffee, and accentuated by war conditions. On March 26 an anti-government conspiracy was reported uncovered in São Paulo, and several persons of substance arrested. In accord with established Brazilian custom the government charged that communists were behind the movement, although those arrested were for the most part linked with São Paulo big business elements, politically dispossessed since 1930. Most of these were shortly released, but 64 communists were sentenced to hard labour. The most concrete result was the tightening of Vargas' political control. That political unrest was still bothering the government, however, was evidenced by rumours, apparently circulated for political effect, that a new constitution would be promulgated and that Vargas would hold a plebiscite. In August Pres. Vargas began a tour of scantily populated western Brazil. On Oct. 4 he took the occasion of the tenth anniversary of the successful revolution which brought him to power to press colonization of the Goya hinterland. A settled policy of encouraging immigration was pushed through the year. The immigration quotas were increased, all restrictions on incoming Portuguese lifted, and unfilled quotas of other countries given to Finnish settlers. Haven was offered to 3,000 German refugees. The state of São Paulo alone was declared able to use 300,000 immigrants. Government officials estimated 50,000 Portuguese farmers would come in under a free passage policy.

Shrinkage of European markets seriously disturbed Brazil's already unsatisfactory economic position. One favourable war effect, however, was the influx of "refugee money" from Europe, as wealthy refugees from Hitler-dominated countries of Europe brought in new capital estimated by some as high as $25,000,000.

Trade relations within America were furthered by Brazil during the year, with the most outstanding success a trade treaty with Argentina in January and a supplementary agreement on Oct. 6. Under the latter each nation set aside approximately $20,000,000 for financing the purchase of surpluses, and undertook generally to lower trade barriers. Further efforts to reduce surpluses were attempted through negotiations in the United States, but unwillingness in the United States to depart from traditional short-time credit practices and refusal of barter made for difficulties. Nevertheless, important financial aid from the United States



PRESIDENT VARGAS of Brazil addressing the opening session of the Inter-American Neutrality committee at Rio de Janeiro, Jan. 15, 1940

through a United States Export and Import bank credit and coffee stabilization through the good offices of that country promised eventually far-reaching economic results.

In October, after extended negotiations, the United States Export and Import bank granted a $20,000,000 loan, with a Brazilian government guarantee, to a newly-organized steel corporation for the erection of a steel-producing plant and rolling mill estimated to cost between $35,000,000 and $40,000,000. United States steel mills agreed to lend the services of technical advisers. The steel plant was expected to require two and a half years for construction. Utilizing Brazilian iron ore (approximately 12% of total world reserves) from Minas Geraes state and coal from southern Brazil, it is expected to have an annual capacity of 300,000 to 350,000 tons, adequate to take care of half of Brazil's steel requirements. One of the first effects of the new steel development was expected to be improvement of the roadbed of the Central railway, over which iron ore would be transported.

Inter-American Coffee Quota Agreement.—The perennial coffee problem was met in part by the Inter-American Coffee Quota agreement of Nov. 28, 1940, the product of six months of strenuous effort. Brazil, producer of half the world's coffee supply, and annually compelled to destroy 25% of her crop for lack of market, stood to benefit from the market stabilization expected to result from the quota agreement. Under the agreement, itself an outgrowth of the economic discussions and recommendations of the Havana conference (*see* Hispanic America and the European War), the 14 coffee-producing American republics and the United States, with the objective of promoting the orderly marketing of coffee under terms equitable both to producers and consumers, established quotas for exports to the United States and to other markets and created the Inter-American Coffee board to administer the agreement. Brazil was given an annual quota of 9,300,000 bags of 60kg. (130lb.) each, or 111,000 bags more than the 1939 exportation, out of a total of 15,545,000 bags for export to the United States, and 7,813,000 bags for export to all other markets. The United States, on its part, undertook to restrict its imports from other markets to 355,000 bags annually. The Coffee board was authorized, should changed conditions render it necessary, to increase or decrease the quotas. The agreement is effective until Oct. 1, 1943. To bring production closer to the consumption level uprooting of many coffee plants was proposed, and intensive study was made of the use of coffee in commercial plastics and of coffee oil in soaps. At the same time government policy is to encourage crop diversification.

An important step of the diversified production policy resulted

from Pres. Vargas' Amazon valley tour, from which revival of the rubber industry was expected. Complete modernization of the industry was promised through new tree tapping methods and government aid in supplying machines for the purpose.

Education.—In 1936 there were 36,661 schools with a total enrolment of 2,862,666, a 25% increase in both schools and enrolment. In 1940, 16% of all national expenditures went to education, 70% for primary instruction. Less than 60 cents U.S. per capita was spent on education.

Army and Navy.—The army has a personnel of nearly 100,000. Military service is compulsory. In 1940, the navy included two battleships, two cruisers, a destroyer and numerous smaller craft. During 1940, national defences were materially strengthened.

Finance.—The monetary unit is the milreis (value in Dec. 1940 approximately 5.06 cents U.S.), ordinarily expressed in contos of 1,000 milreis each for large transactions.

On March 8, 1940, debt service on 108 foreign obligations of Brazil and its states and municipalities, aggregating $1,076,000,000 principal and in default since Nov. 10, 1937, was resumed under a plan which provided for payment of all arrears by March 31, 1944.

Communications.—Under normal conditions Brazil enjoys excellent external communication. The state-owned Lloyd Brasileiro line continued to enlarge its fleet during 1940. Air transport by Pan American airways, connecting Brazil with all parts of America, was improved during the year by the addition of one flight north and south weekly, giving three connections weekly to New York and to Buenos Aires and shortening the time to New York to 36 hours. Former transatlantic flights by German, French and Italian lines were maintained part of the year but abandoned. The German Condor line, however, operated several routes within the country. Domestic lines operated over routes 68,472km. in length. Three daily flights connected Rio de Janeiro and São Paulo.

There are 20,830mi. of railway and over 75,000mi. of highway. Nearly half the railway and over a third of the highway mileage is in two states, Minas Geraes and São Paulo. Communication in the Amazon basin is almost entirely by water, supplemented by air transport. Ocean-going steamers are the chief means of communication between northern and southern ports. Lack of adequate rail and highway facilities within the country is an outstanding weakness, but several notable improvements were begun in 1940. A 6,000km. highway development project in Rio Grande do Sul, costing 70,000 contos, was started. Most important was the Santos to Arica (Chile) railway. It will eventually give transcontinental service through Bolivia to the Pacific (*see* BOLIVIA). Electrification of several routes was continued during the year and considerable new equipment acquired. In 1940 there were 122,101km. of telegraph lines.

Foreign Trade.—In 1939 exports totalled 5,615,519 contos, a 10·2% advance over 1938; imports were 4,983,632 contos, a 4·1% decline. Coffee, the leading export, contributed 39·8% of total values against 45·1% in 1938, raw cotton 20·7% against 18·2%. Hides and skins, and cacao, 4·4% and 4%, respectively, and oranges, carnauba wax, canned meats, lumber, fresh meats and tobacco, contributing from 2·1% to 1·7% each, showed little change. Leading imports were machinery and apparatus (19·9%), iron and steel manufactures (8·9%), wheat (7·1%), chemicals and pharmaceuticals (5·8%), automobiles (5·17%).

The largest physical increase in exports over 1938 was to the United States (16%), the largest proportionate increase to China, whose purchases, practically all in raw cotton, increased 500%. The leading purchasers of exports were: United States, 36·2% (1938: 34·3%); Germany, 12% (1938: 19·1%); Great Britain, 9·6% (1938: 8·8%); France, 6·3% (1938: 6·4%); Argentina, 5·5% (1938: 4·5%); Japan, 5·4% (1938: 4·6%); Netherlands, 3·8% (1938: 4·2%); Sweden, 3·1% (1938: 2·1%); China, 3% (1938: 0·5%); Belgium and Luxembourg, 2·9% (1938: 3·6%).

The greatest increase in import trade was in purchases from the United States, which increased more than a third, the greatest decrease in purchases from Germany. The leading suppliers of imports were: United States, 33·6% (1938: 24·2%); Germany, 19·2% (1938: 24·9%); Great Britain, 9·3% (1938: 10·4%); Argentina, 8·4% (1938: 11·8%); Belgium and Luxembourg, 4·2% (1938: 4%); Netherlands West Indies, 3·4% (1938: 3·2%); France, 2·8% (1938: 4%); Sweden, 2·3% (1938: 2·5%); Italy, 1·8% (1938: 1·8%); Portugal, 1·8% (1938: 1·6%).

European war developments vitally influenced Brazil's foreign trade during 1940, depriving her of several important markets, including the Scandinavian countries, the heaviest European consumers of Brazilian coffee. Including Germany, markets formerly absorbing over 3,000,000 bags of coffee, were lost. In the first ten months of the year exports were 17·3% less than in the corresponding period of 1939, imports 1·2% more. The United States took 39·5% of exports (compared with 34·8% in 1939), and supplied 51·4% of imports (against 30·0% in 1939). In the first 11 months of 1940, imports were valued at 4,606,972 contos, exports at 4,447,497 contos, an unfavourable trade balance of 159,375 contos in contrast with a 764,976 contos favourable balance in the corresponding period of 1939. In Nov. 1940, however, exports exceeded imports.

Agriculture and Mining.—Brazil is primarily and predominantly agricultural. Coffee, of which she produces over half of the world supply, is the greatest single crop. São Paulo especially and other states of southern Brazil depend largely upon coffee. Coffee exports have sharply declined in both volume and value since 1933, when they contributed over 70% of all export values, against 39·1% in 1939. Improvement of the situation, however, was expected from the Inter-American Coffee Quota agreement (*see* above). In 1939, 16,498,525 bags (of 60kg. each) of coffee were exported, 55·6% to the United States, with France, Germany, Sweden and the Netherlands, next in order. Overproduction has been met by destruction of part of each year's crop. In 1939 only 3,519,874 bags were destroyed, but 9,380,000 bags out of the 20,720,000 bag 1940–41 crop were to be destroyed.

Cotton was of increasing importance. The 1939 crop was valued at 1,159,420 contos (against 32,781 contos in 1933). Nearly 90% was produced in São Paulo state. The 1940–41 crop is estimated as 322,900 metric tons (1939–40: 292,384 tons). Exports in the first nine months of 1940 were 160,561 tons, against 292,971 tons in the same period of 1939. Domestic consumption accounted for 119,000 tons in 1939.

Brazil was the world's fifth largest cotton producer, and was exceeded in maize production (for domestic consumption) only by the United States. Other important agricultural products were rice, sugar, oranges, beans, manioc flour, maté (Paraguay tea). Carnauba wax, used extensively in varnishes and polishes, was of increasing importance, with 70% normally going to the United States. In 1939, 10,001 tons were exported. Under government auspices the quality was being improved. Piauhy and Ceará states were the chief producers.

Some 5,000,000,000,000 board feet of hardwood was estimated to be available. Revival of rubber production was being furthered (*see* above).

The livestock industry was important, especially in Minas Geraes, Rio Grande do Sul and Bahia states. In 1935 there were 40,513,900 head of cattle, 6,051,700 horses, 3,233,000 asses and mules.

Brazil has extensive iron deposits, but lack of transportation has hampered their development. In 1940, however, a huge steel plant was begun (*see* above) with eventual revolutionary effects on Brazilian economy expected. Coal production, centring in the southern states of Rio Grande do Sul and Santa Catherina, increased nearly a third in 1940. Large undeveloped nickel deposits exist in Goyaz. Mineral production in 1939 included: coal, 1,045,975 tons; laminated iron, 98,649 tons; pig iron, 160,016 tons; steel, 112,174 tons; cement, 697,793 tons.

Petroleum production, developed in 1939, was growing rapidly, with an output estimated around 40,000bbl. annually.

Manufacturing.—Manufacturing was in no sense adequate for domestic needs, but received great stimulus after 1934, especially under war conditions. A third of all manufacturing was in São Paulo state. Textiles, the most important manufactured product, account for 24% of industrial production, foodstuffs 22%. In 1939, exports of cheap textiles were valued at $1,500,000.

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(L. W. BE.; J. S. CU.)

Bread and Bakery Products. Further improvement in the nutritive properties of white bread by increasing the content of vitamins and minerals has been the most important development in the U.S. and British baking industries. In Great Britain the government authorized the addition of thiamin (vitamin B_1) and suitable calcium salts to all white flour. In the U.S. the Millers' National federation went on record late in 1940 in favour of the promotion and greater use of "vitamin flour."

White flour in the U.S. is already a good source of dietary calcium, since most commercial white loaves are now made with considerable amounts of milk solids. The average loaf (other than the French and Italian varieties) contains about 6% milk solids on the basis of the flour used. This amount of whole or skimmed fluid, condensed, or dried milk in the bread formula not only increases calcium, in favourable ratio to phosphorus, but also adds to the loaf good proteins and a considerable amount of riboflavin (vitamin B_2).

The vitamin B_1 or thiamin content of commercial white bread in the U.S. is being increased to the equivalent of that of 100% whole wheat by the use of special high-vitamin yeast, by the direct addition of crystalline vitamins and wheat germs to the dough, and by the use of white flour in which this vitamin has been retained or to which it has been added.

According to the biennial census of manufactures of the U.S. department of commerce (preliminary report), the number of baking establishments in that country doing $5,000 or more business in 1939 was 18,049. These concerns employed an average of 201,537 wage earners, who were paid $262,000,268. The cost of supplies was $567,443,736 and the total value of the products was $1,211,395,278. Of the entire number of baking establishments, 2,569 were wholesale only, 8,980 were retail only and 6,500 were wholesale and retail combined. (*See* also FLOUR AND FLOUR MILLING.) (J. A. To.)

Brewing and Beer. The generic word beer covers the malt beverage group including beer, ale, porter, etc. In 1940 the product was manufactured in 40 states and sold in all of the states under regulation and licence. It is taxed by the federal and state governments, and in scattered cases local taxes are imposed. Aside from taxation, control is vested in the states, which generally treat beer distinctly from liquors because of its low alcoholic content.

The industry's production and sales statistics are based on United States internal revenue reports of tax-paid withdrawals (sales) based on the United States fiscal years ending June 30. As cited here, the reports cover the period since beer's re-legalization by act of congress effective April 7, 1933 (which preceded the effective date of repeal of the prohibition amendment by 8 months). On June 30, 1940 there were 572 breweries as compared with the peak of 750 in 1935.

Sales Records.—Following are the sales records in United States barrels (31gal.) by fiscal years ending June 30th: 1933 (85 days) 6,277,728; 1934, 32,266,039; 1935, 42,228,831; 1936, 48,759,840; 1937, 55,391,960; 1938, 53,926,018; 1939, 51,816,874; 1940, 53,014,230.

Federal reports, subject to minor correction after final audit, show tax-paid withdrawals for the six months July-Dec. 1940 totalling 26,904,571 barrels. Per capita consumption was 12·5gal. in 1940 as compared with 12·3 in 1939.

Features of the calendar year 1940 included: sales increases of 226,000bbl. during the first six months over the same period in 1939; sales decline of 1,205,371bbl. during the last six months over the same period in 1939; imposition July 1 of an additional emergency tax of $1 per bbl. for national defence; industry activities to "clean up or close up" law violating retail outlets.

Law Observance.—The industry's nation-wide program, being conducted through the United Brewers' Industrial foundation, by the end of 1940 was being applied intensively in 14 states through committees of brewers and beer distributors, which worked directly with retailers and the public authorities to protect the good repute of beer and brewing from abuse by a minority of law violators. These committees reported 22,000 investigations of retail outlets to the end of 1940 and 2,600 warnings resulting in some 1,200 voluntary corrections of improper conditions and nearly 1,000 licence revocations and other legal actions.

Market Conditions.—With the imposition of the emergency defence tax, the total federal tax became $6.00 a barrel. This, plus state and local taxes, which together place an average levy of $8.50 on each barrel of beer, gave the industry an immediate problem of increased prices and a disturbed market condition which was considered mainly responsible for the marked decline in beer sales during the second half of 1940. Package sales, considered significant of increased home use, continued to gain in 1940 when nearly 51% of all beer was sold in bottles or cans. In 1934 the percentage was 25% package against 75% draught.

Taxes.—Federal excise and special taxes on beer for the fiscal year 1940 totalled $267,776,187. Cumulative federal taxes since re-legalization totalled $1,754,701,952. State and local taxes for that period are estimated at $700,000,000, bringing the combined public revenue from beer to approximately $2,450,000,000 for the period from April 7, 1933 to June 30, 1940.

The European war disrupted world-production and consumption reports for this industry. (H. Hy.)

Brick. The revival of the building industry is increasing the demand for all types of building materials to such an extent that brick production in the United States has more than trebled since 1934; preliminary reports indicate an increase of about 28% in 1939 and a decrease of 6% in 1940, each as compared with the preceding year.

Brick Production in the United States
(In millions)

Type of Brick	1936	1937	1938	1939
Common	2,966.5	3,252.6	2,729.9	3,408?
Face	848.8	937.6	803.1	1,085?
Hollow	8.4	5.3	7.3	?
Salt-glazed	48.6	51.0	43.0	?
Vitrified	88.9	90.2	94.1	76?
Sand-lime	103.2	138.3	95.0	..
Fireclay	626.6	728.4	365.2	..
Silica	229.3	220.1	91.0	..
Magnesite and Chromite	20.4	22.8	12.1	..

Production in Canada is chiefly common and face brick, with only small amounts of other types, and is mainly from imported clays; total production was 102,670,000 in 1934 and 163,456,000 in 1939, as compared with 463,923,000 in 1929. (G. A. Ro.)

Bridge, Contract: *see* CONTRACT BRIDGE.

Bridges. Since the completion of the Brooklyn bridge in 1883, the successive record span lengths achieved by bridge engineers are shown in Table I.

Table I.—Successive Record Spans

Year	Bridge	Location	Type	Span
1883	Brooklyn	New York	Suspension	1,595½ ft.
1889	Forth	Scotland	Cantilever	1,700
1917	Quebec	Canada	Cantilever	1,800
1929	Ambassador	Detroit	Suspension	1,850
1932	George Washington	New York	Suspension	3,500
1937	Golden Gate	San Francisco	Suspension	4,200

Table II.—*World's Longest Spans*

Type	Bridge	Location	Date	Span
Suspension (Cable)	Golden Gate	San Francisco	1937	4,200 ft.
,, ,,	George Washington	New York	1932	3,500
,, ,,	Narrows	Tacoma	1940	2,800
,, ,,	Transbay	California	1936	2,310
,, ,,	Whitestone	New York	1939	2,300
,, ,,	Ambassador	Detroit	1929	1,850
,, ,,	Delaware River	Philadelphia	1926	1,750
Suspension (Eyebar)	Florianopolis	Brazil	1926	1,114
,, ,,	Elizabeth	Budapest	1903	951
Cantilever	Quebec	Canada	1917	1,800
,,	Forth	Scotland	1889	1,700
,,	Transbay	California	1936	1,400
,,	Longview	Columbia River	1927	1,200
,,	Queensboro	New York	1909	1,182
,,	Carquinez Strait	California	1927	1,100
,,	Montreal Harbour	Quebec	1929	1,097
Steel Arch	Kill Van Kull	New York	1931	1,652
,,	Sydney Harbour	Australia	1931	1,650
,,	Hell Gate	New York	1916	977½
,,	Henry Hudson	New York	1936	800
Continuous Truss	Duisburg	Germany	1935	839
,, ,,	Sciotoville	Ohio River	1917	775
,, ,,	Goering	Neuwied, Germany	1935	700
,, ,,	Chain of Rocks	Mississippi River	1929	699
,, ,,	Cincinnati	Ohio River	1928	675
Wichert Truss	Homestead	Pittsburgh	1937	533½
Continuous Girder	Mangfall	Darching, Germany	1935	354
Simple Truss	Metropolis	Ohio River	1916	720
,, ,,	Paducah	Ohio River	1929	716
Concrete Arch	Plougastel	Brest, France	1929	612
,, ,,	Stockholm	Sweden	1935	593
,, ,,	La Roche-Guyon	France	1937	528
,, ,,	Westinghouse	Pittsburgh	1931	460
Vertical Lift	Cape Cod Canal	Massachusetts	1935	544
,, ,,	Marine Parkway	New York	1937	540
,, ,,	Burlington	New Jersey	1930	534
Swing Span	Fort Madison	Mississippi River	1927	525
,, ,,	Portland	Oregon	1908	521
,, ,,	Omaha	Nebraska	1893	520
Bascule	Sault Ste. Marie	Michigan	1914	330
,,	Erie Avenue	Lorain, O.	1940	333
,,	Chattanooga	Tennessee	1917	310
Masonry Arch	Plauen	Saxony	1905	295
,, ,,	Salcano	Austria	1906	279

The Tacoma Narrows bridge at Puget Sound, Wash., built at a cost of $6,400,000, with a main span of 2,800ft. (the third longest in the world), was completed and dedicated July 1, 1940. On Nov. 7, 1940, the structure was wrecked in a 42-mi. wind which caused a vertical wave motion of opposite phase in the two sides of the bridge, producing a cumulative twisting (28ft. high) of destructive magnitude. The failure was charged to aerodynamic instability of the design. It was by far the most slender suspension bridge ever built, both laterally and vertically, the width between cables being only 39ft. (or 1/72 of the span) and the depth of the stiffening girders only eight feet (or 1/350 of the span).

The Howrah bridge over the Hooghly river, India, under construction 1938 to 1940, is a cantilever bridge costing £1,750,000.

The Story bridge over the Brisbane river, Queensland, under construction 1935 to 1941, at a cost of £1,600,000, with a cantilever span of 924ft., is a government-owned toll bridge and the second longest span in Australia.

The Rainbow bridge at Niagara Falls, with a 950-ft. steel arch (the fourth longest arch span in the world), was commenced in May 1940 to replace the old arch bridge of 840-ft. span which was wrecked by the ice in Jan. 1938. The end pins are located 29ft. higher. The new span, costing $4,000,000, will be a publicly owned and operated toll bridge under an international commission.

Four new bridges over the Mississippi river were completed in 1940: at Baton Rouge, La. (cantilever—railroad and highway—$8,500,000—two 858-ft. spans); at Natchez, Miss. (cantilever—$3,450,000—two 875-ft. spans); at Greenville, Miss. (cantilever—$4,500,000—840-ft. span); and at Rock Island, Ill. ($2,500,000—five tied-arch steel spans, two at 539ft.). All but the last are toll bridges.

A cantilever toll bridge over the Ohio river at Owensboro, Ky., completed 1940 at a cost of $1,730,000, has a main span of 751ft.; and one at Jamestown, R.I., completed 1940 at a cost of $3,000,000, has a main span of 640 feet.

Four bridges using the Wichert continuous type of construction were completed in 1939–41: one over the Susquehanna river at Havre de Grace, Md. (1940), $4,500,000, 7,618ft. long, with 36 Wichert truss and girder spans, including two arch-shaped Wichert trusses of 456ft. span; one over the Potomac river at Ludlow Ferry, Md. (1941), $5,500,000, two miles long, including an 800-ft. cantilever span (with piers on steel piles 150ft. long to rock 200 feet deep) and 22 Wichert approach spans (longest truss spans 350ft., longest girder spans 162ft.); one over the Potomac river at Hancock, Md. (1939), $1,000,000, with 20 Wichert truss and girder spans; and the Wilmot street bridge at Pittsburgh (1940) with three Wichert truss spans (longest 360 feet).

The Thomas A. Edison bridge over the Raritan river at Perth Amboy, N.J., built 1939 to 1940 at a cost of $4,670,000, is of continuous plate girder construction, with one span of 250ft. and eight spans of 200 feet. Also completed 1940, one of the approaches to the new Main avenue bridge in Cleveland, O., has a steel girder span of 271ft. (the longest plate girder span in the U.S.). This will be exceeded by the new Hartford bridge over the Connecticut river with three continuous steel girder spans of 270, 300 and 270ft., under construction 1940 to 1942 at a cost of $2,000,000.

The concrete pontoon bridge across Lake Washington in Seattle, built by the state of Washington toll bridge authority at a cost of $8,500,000, was dedicated July 2, 1940. The floating portion 6,561ft. long is made up of 25 precast cellular reinforced concrete pontoons, 117 to 378ft. long, 59ft. wide and 14½ft. deep, floating seven feet out of water, with a central 202-ft. opening for ships, provided by a sliding indrawn floating span. A second concrete pontoon bridge is under construction at Hobart, Tasmania; and at Istanbul, Turkey, the Golden Horn is now spanned by a steel pontoon bridge 1,500ft. long.

A new highway bridge over the Black river at Lorain, O., has a double-leaf bascule span of 333ft., the second longest in the world.

THE TACOMA NARROWS BRIDGE collapsed in a windstorm Nov. 7, 1940, and fell into Puget sound, Washington. Completed only four months before, it was the third longest single suspension bridge in the world. None was killed in the accident

LAKE WASHINGTON BRIDGE at Seattle, Wash., longest floating bridge in the world, was dedicated and opened July 2, 1940. It stretches for almost a mile and a half on steel and concrete pontoons across the lake

In line with the trend toward public ownership and operation of toll bridges, two notable privately owned bridges were purchased by the states in 1940: the Carquinez strait bridge (cantilever, built 1927) purchased by California for $6,480,000; and the Bear mountain bridge (suspension, built 1923) purchased by New York state for $2,275,000.

The world's longest spans in 1940 are listed in Table II.

(D. B. S.)

Briquettes, Fuel: *see* FUEL BRIQUETTES.
British Borneo: *see* BORNEO.

British Columbia, the western province of the Dominion of Canada, covers an area of 366,255 sq.mi., being equivalent in size to the United Kingdom, France, Holland, Belgium and Denmark combined. The population of the province, 774,000 (1939), is concentrated in the southwestern part of the province, mainly in the cities of Vancouver, Victoria and New Westminster. Of this population about 47,900 are orientals, 26,300 being Japanese and 21,600 being Chinese. About 90% of the Japanese and 60% of the Chinese in Canada reside in this province.

History.—Early in the year the report of the Royal Commission on Dominion-Provincial Relations was released by the Canadian prime minister. This report, commonly known as the Rowell-Sirois report, awarded the sum of $750,000 to the province of British Columbia in settlement of various claims against the dominion government. The report proposed a major revision in existing dominion-provincial financial arrangements, including the transfer of certain important sources of revenue—including income tax and succession duties—from the province to the dominion. Members of the opposition sought to ascertain the views of the provincial government on these questions during the fall session of the legislative assembly, but no official pronouncement was made at that time. The provincial government has consistently protested the entry of the dominion government into the income tax field. Premier T. D. Pattullo announced that his government had accepted the invitation of Prime Minister Mackenzie King to attend the Dominion-Provincial conference in Ottawa during Jan. 1941, to discuss the recommendations of the Rowell-Sirois report.

A second event of importance occurred in April when the verdict of the supreme court of Canada gave the government of British Columbia authority to proceed with the regulation of the sale of petroleum products. The oil companies were notified by the provincial government that fixed prices would become effective April 24.

As a result, the oil companies, on April 26, suspended the sale of gasoline to retailers throughout the entire province. A compromise settlement was finally effected after a week of this gasoline strike, establishing the wholesale price of gasoline one cent above the price set in the disputed governmental order. Subsequently, the provincial government called a special session of the legislative assembly, and at this time passed the Coal and Petroleum Products Control Board Act, Amendment Act 1940, which would permit the provincial government to enter in and operate all branches of the petroleum industry.

Only legislation of minor importance was enacted at the fall session of the legislative assembly. In presenting his budget to the legislative assembly in November, Finance Minister John Hart stated that the province would refrain from the introduction of new tax measures during the war in order to conserve the national income for the maximum war effort. Mr. Hart reported that revenue collections amounting to $32,826,438 during the year ended March 31, 1940, had exceeded all previous records. The finance minister, forecasting a revenue surplus of $2,010,184, estimated that provincial revenues would reach $31,957,391, and ordinary expenditures $29,947,207, during 1941–42; as compared with an estimated revenue of $29,300,141 and an expenditure of $29,268,790 for the fiscal year 1940–41.

Several prominent British Columbia citizens were called to the federal capital to serve with the war effort. H. R. MacMillan, Vancouver, was appointed timber controller for Canada in June, and was given the additional position of chairman of the War Requirements board in November. J. P. D. Malkin, Vancouver, was appointed director-general of purchases under the department of munitions and supply.

Industries.—British Columbia experienced a period of intense business activity during 1940. Federal marketing assistance relieved the anxiety of fruit-growers whose markets were adversely affected by United Kingdom import restrictions. Shipbuilding was stimulated in the coastal area as a direct result of the war, and other branches of secondary industry were similarly affected. Lumber shipments to the United Kingdom were well maintained, in spite of shipping difficulties. Arrangements were made early in February for transcontinental rail shipments of British Columbia lumber to exporting points in Eastern Canada. All basic industries, according to preliminary estimates, registered gains over the preceding year. The gross value of production amounted to $57,500,000 in agriculture (1939, $49,402,000); $18,726,000 in fisheries (1939, $17,700,000); $97,500,000 in forestry (1939, $88,221,000); and $72,000,000 in mining (1939, $65,682,000).

(G. N. P.)

British East Africa. Under this heading are grouped British colonial territories on the east coast of Africa, of which certain essential statistics are given in the table. *See* BRITISH EMPIRE for population, capital towns, status and governors. (*See* also separate heading, RHODESIA.)

History.—Till the summer of 1940 British East Africa lay outside the theatre of war, since Germany was the only enemy and possessed no bases for launching an attack on an area so far from Europe. But it was well understood that at any moment Italy might decide to throw in its lot with Germany, and in Eritrea and Italian Somaliland and recently conquered Ethiopia Italy was British East Africa's immediate neighbour. From the outbreak of the war, therefore, these British territories, Kenya and Uganda in particular, were more concerned with immediate military needs than any other part of the British overseas empire. They took the same measures of internal security as other colonies, such as internment of enemy aliens; and, like other colonies, they mobilized their economic resources in aid of the common war-effort, on

British East Africa

Territory and Area in sq.mi.	Principal Products (in metric tons)	Imports and Exports (in thousand £)	Road, Rail and Shipping	Revenue and Expenditure (in thousand £)	Education: Elementary and Secondary
KENYA 224,960	(1938) maize, 82,400; coffee, 17,000	(1939) imp. 8,989*; exp. 8,133*	(1937) rds. arterial, 3,160 mi.; rlys. 1,290 mi., shpg. cleared 2,158,767 net tons	(1938) rev. 3,776; exp. 3,649	(1937) Europ.: schls., 35, schlrs., 2,091; African schls., 52, schlrs., 4,593; Indian schlrs., 7,635: mission schls. 100
MAURITIUS . . . . . 720 (dependencies, 87)	(1939) sugar, 229,457; copra, 1,482; tobacco, 281	(1939) imp. Rs. 31,679: exp. Rs. 37,188	(1939) rds. 700 mi.; rly. 141 mi. shpg. cleared 776,454 net tons	(est. 1939–40) rev. Rs. 17,330; exp. Rs. 17,324	(1938) schls , 126; schlrs., 39,952
NYASALAND 47,949	(1939) tobacco 5,575; tea, 5,083	(1939) imp. 715.4; exp. 823.8	(1937) rds. main, 1,852 mi.; rly. 289 mi.	(1938) rev. 842; exp. 811	(1939) elem.: Europ.: schls., 4, schlrs., 117; African: schls., 4,279, schlrs., 204,761
SEYCHELLES 156	(1938) export: copra, 4,755; cinnamon leaf, value, Rs. 179,206	(1938) imp. Rs. 1,137; exp. Rs. 944	(1938) 46 mi. of 1st class cart rd.	(est. 1939) rev. Rs. 818; exp. Rs. 784	(1938) elem. schls., 26; schlrs., 3,008
BRITISH SOMALILAND 68,000	(1938) export: gums and resins, 594; skins, number, 1,699,883	(1938) imp. 728; exp. 207	(1938) rds. for wheeled traffic, *c.*2,000 mi.	(1938) rev. 236; exp. 227	(1938) elem.: govt. schls., 2; schlrs., 121; private-aided schls., 14, schlrs., 514
TANGANYIKA 360,000	(1939) exp.: coffee, 16,600; cotton, 7,163	(1939) imp. 3,040; exp. 4,265	(1938) rds. 2,783 mi.; rly. 1,377 mi.; shpg. cleared 3,077,951 net tons	(est. 1939) rev. 2,162; exp. 2,436	(1938) elem.: Europ.: schls., 19; schlrs., 934; Indian: schls., 67, schlrs., 5,128; African: schls., 1,014, schlrs., 76,360
UGANDA 93,981	(1938) coffee, 14,232; cotton, 72,541	(1938) imp. 2,993; exp. 4,069	(1938) rds. 7,488 mi.; rly. 332 mi.	(1938) rev. 1,864; exp. 2,020	(1938) elem.: schls., 300, schlrs., 34,232; sec.: schls., 22, schlrs., 1,250
ZANZIBAR (640) and PEMBA (380)	(1939) cloves, 13,180; copra, 10,716	(1939) imp. 836; exp. 999.8	(1939) rds. (Z.) 151 mi.; (P.) 71 mi.	(1938) rev. 499; exp. 452	(1938) elem.: schlrs., (govt. schls.) 2,428, (private schls.) 2,930

*Including Uganda.

a broad co-operative basis. Conferences were held by the governors and the directors of agriculture of Kenya, Uganda and Tanganyika; technical committees were established to study the possibilities of the local manufacture of war materials; at a later stage an East Africa economic council was projected for dealing with all matters of common concern; and in October representatives of all the territories attended the viceroy's conference at Delhi which met to organize war supplies on the widest possible basis—to establish, in fact, one economic British empire front running from South and East Africa through the middle east to India and thence to Malaya and Australasia. In this joint economic effort each territory took what part it could.

Kenya's chief contribution was the production of coffee, wool, sisal and flax. New factories were built for treating flax, for weaving blankets, and for making boots from local leather. Uganda provided cotton, rubber, coffee, sisal and tin, and began the manufacture of power alcohol from sugar, and diesel oil from cotton seeds. Mandated Tanganyika increased its output of sisal and cotton. Similar efforts to expand production were made in the little island protectorate of Zanzibar and in Mauritius and the Seychelles in the Indian ocean. All these territories, mainland and islands alike, were contributing at the same time to the cost of the war. By the autumn of 1940, the total of "war gifts" made by them, officially and privately, amounted to over £400,000. Two particular items deserve to be mentioned: the Kikuyu, Kamba and Meru tribes in Kenya gave £10,000, and the chiefs and peoples of Teso in Uganda £6,000, for the making of aircraft for the royal air force.

Meantime, the territories had been arming themselves to meet the possibility of an Italian attack. In peacetime the military force in all British East Africa amounted to only some 1,200 African soldiers with 47 British officers (the King's African Rifles). This was rapidly expanded by voluntary recruitment, and further volunteer defence units, both British and African, were enlisted. As the year drew on, reinforcements arrived in Kenya from South Africa, Rhodesia, Nigeria and the Gold Coast, so that, when Italy entered the war in June, it was confronted in Kenya with a small but fast-growing army and air force drawn from most of the African territories of the British empire. Its role was necessarily defensive for the time being, in face of the much greater strength of the Italian forces, and, after a gallant rear-guard action at Moyale, the British outposts were withdrawn from the arid belt which lies along Kenya's northern frontier. The collapse of France and the acceptance of Pétain's armistice by the governor of French Somaliland necessitated a similar retreat in British Somaliland, for it was now exposed to attack from the flank which the French had hitherto protected.

The invasion began on Aug. 4 by three routes. The Italians used the greater part of two divisions, including mechanized forces. The small British forces on both fronts retreated on Berbera and on Aug. 19 it was announced that they had been withdrawn without loss by sea. (R. Co.)

ITALIAN TROOPS rolling across the plains of British Somaliland after the British evacuation of Aug. 19, 1940

British Empire. The governments of the British empire and the governors and premiers are as follows:

Country	Area Sq. miles (approx.)	Population (000's omitted)	Capital	Status	Governors and Premiers
Europe					
Great Britain and Northern Ireland	93,991	47,680	London	Kingdom	George VI, King-Emperor. *Prime Minister* of Great Britain: Winston Churchill. Governor of Northern Ireland: The Duke of Abercorn. *Prime Minister* of Northern Ireland: J. M. Andrews.
Channel Islands	75	96	St. Helier; St. Peter Port	Kingdom of Great Britain and N. Ireland	*Jersey:* Maj. Gen. J. M. R. Harrison. *Guernsey:* Maj. Gen. A. P. D. Telfer-Smollett.
Eire	26,601	2,934	Dublin	Dominion	*President:* Dr. Douglas Hyde. *Prime Minister:* Eamon de Valera.
Gibraltar	2	20	Gibraltar	Colony	Lt. Gen. Sir Clive Liddell.
Isle of Man	227	49	Douglas	Kingdom of Great Britain and N. Ireland	Vice-Adm. Lord Granville.
Malta	122	268	Valletta	Colony	Lt. Gen. Dobbie.
Asia					
Aden, Perim, etc.	80	48	Aden	Colony	J. Hathorn Hall.
Aden Protectorate	112,000	600		Protectorate	
Bahrein Islands	213	120	Manama	Protectorate	Ruler: H. H. Shaikh Sir Hamad bin 'Isa al Khalifah.
Borneo:					
State of North Borneo	29,500	302	Sandakan	Protectorate	C. R. Smith, Gov.
Brunei	2,226	36	Brunei	Protectorate	J. G. Black (Brit. Res.)
Sarawak	50,000	c. 450	Kuching	Protectorate	Rajah: H. H. Sir Charles Vyner Brooke.
Burma	261,000	16,000	Rangoon	Member of the British Commonwealth of Nations	Sir A. D. Cochrane.
Ceylon	25,332	5,864	Colombo	Colony	Sir A. Caldecott.
Cyprus	3,572	376	Nicosia	Colony	Sir W. D. Battershill.
Hongkong	391	1,010	Victoria	Colony	Sir G. A. S. Northcote, Gov.
Indian Empire	1,575,185	362,000	Delhi	Member of the British Commonwealth of Nations	Emperor of India: H.I.M. George VI. *Secretary of State:* L. S. Amery. *Viceroy and Governor General:* Marquess of Linlithgow.
Malaya:					
The Straits Settlements	1,357	1,311	Singapore	Colony	Sir T. S. W. Thomas, Gov.
Federated Malay States	27,540	2,125		Protectorates	The Rulers of Perak, Selangor, Negri Sembilan, and Pahang.
Unfederated Malay States	24,728	1,600		Protectorates	The Rulers of Johore, Kedah, Perlis, Kelantan, Brunei, and Trengganu.
Palestine	10,100	1,466	Jerusalem	Mandated territory	Sir H. A. MacMichael, High Commissioner
Trans-Jordan	34,740	350	Amman	Mandated territory	Emir H. H. Abdullah ibn Hussein.
Africa					
Kenya Colony and Protectorate	224,960	3,334	Nairobi	Colony and protectorate	Sir Henry Monck-Mason Moore.
Uganda Protectorate	93,981	3,711	Entebbe	Protectorate	Sir Charles Dundas.
Zanzibar	1,020	243	Zanzibar	Colony and protectorate	Henry Guy Pilling (Brit. Res.).
Mauritius	809	413	Port Louis	Colony	Sir Bede Clifford.
Nyasaland	47,949	1,639	Blantyre	Protectorate	Sir Donald Mackenzie-Kennedy.
St. Helena and Ascension	81	4	Jamestown	Colony	
Seychelles	156	31	Victoria	Colony	Sir A. F. Grimble.
Somaliland Protectorate	68,000	350	Berbera	Protectorate	V. G. Glenday.
Basutoland Protectorate	11,716	570	Maseru	Colony	Sir Edward Harding.
Bechuanaland Protectorate	275,000	270	Mafeking, in Cape Province	Protectorate	Sir Edward Harding.
Southern Rhodesia	150,333	1,320	Salisbury	Self-governing colony	Sir H. J. Stanley.
Northern Rhodesia	290,323	1,400	Lusaka	Colony	Sir J. A. Maybin.
Swaziland	6,705	160	Mbabane	Protectorate	Sir Edward Harding.
Union of South Africa	472,550	10,160	Seat of Government, Pretoria; Seat of legislature, Cape Town	Dominion	Sir P. Duncan. *Premier:* General J. C. Smuts.
South-West Africa	317,725	365	Windhoek	Mandated territory	Dr. D. G. Conradie, Administrator.
Nigeria, including British Cameroons	372,674	19,646	Lagos	Colony and protectorate (mandated territory)	Sir B. H. Bourdillon.
Gambia	3,999	200	Bathurst	Colony	Sir W. T. Southorn.
Gold Coast, including British Togoland	91,843	3,387	Accra	Colony and protectorate	Sir A. W. Hodson.
Sierra Leone and Protectorate	27,925	1,950	Freetown	Colony and protectorate	Sir D. J. Jardine.
Anglo-Egyptian Sudan	967,500	5,858	Khartoum	Condominium	Sir H. Huddleston.
Tanganyika Territory	360,000	5,220	Dar-es-Salaam	Mandated territory	Sir M. A. Young.
America					
Bahamas	4,375	67	Nassau	Colony	H.R.H. Duke of Windsor.
Barbados	166	191	Bridgetown	Colony	Sir E. J. Waddington.
Bermudas	19	31	Hamilton	Colony	Maj. Gen. D. J. C. K. Bernard.
British Guiana	89,500	337	Georgetown	Colony	Sir W. E. F. Jackson.
British Honduras	8,598	57	Belize	Colony	Sir Alan C. Maxwell Burns.
Canada	3,729,665	11,165	Ottawa	Dominion	Earl of Athlone. *Premier:* W. L. Mackenzie King.

Country	Area Sq. miles (approx.)	Population (000's omitted)	Capital	Status	Governors and Premiers
America (Continued)					
Falkland Islands and Dependencies	4,618	3	Port Stanley	Colony	Sir H. Henniker-Heaton.
Jamaica and Dependencies	4,846	1,186	Kingston	Colony	Sir A. F. Richards.
Leeward Islands (Antigua, St. Kitts-Nevis, Dominica, Montserrat, and the Virgin Islands)	725	142	St. John (Antigua)	Colony	Sir G. J. Lethem.
Newfoundland and Labrador	*c.* 152,000	295	St. John's	Colony, Constitution suspended	Vice-Adm. Sir H. T. Walwyn.
Trinidad and Tobago	1,980	473	Port of Spain	Colony	Maj. Sir H. W. Young.
Windward Islands (Grenada, St. Vincent, and St. Lucia)	521	213	St. George's (Grenada)	Colony	Sir H. B. Popham.
Oceania					
Commonwealth of Australia	2,974,581	6,997	Canberra	Dominion	Brig. Gen. Lord Gowrie. *Premier:* R. G. Menzies.
Fiji	7,055	205	Suva	Colony	Sir H. C. Luke.
New Zealand	103,415	1,640	Wellington	Dominion	Marshal of R. A. F., Sir Cyril Newall. *Premier:* Peter Fraser.
Papua	90,540	280	Port Moresby	Part of Commonwealth of Australia	H. L. Murray, Administrator.
Pacific Islands	11,911	162		Colonies and protectorate	Sir H. C. Luke.
New Hebrides	5,700	60	Vila	Condominium	Sir H. C. Luke.
New Guinea, Territory of	93,000	670	Rabaul	Mandated territory	Brig. Gen. W. Ramsay McNicoll.
Western Samoa	1,133	58	Apia	Mandated territory	A. C. Turnbull, Act. Administrator.
Nauru	8	3		Mandated territory	Lt. Col. F. R. Chalmers.

British Guiana, a British crown colony in northeastern South America; language, English; capital, Georgetown; governor, Sir Wilfred E. F. Jackson. The area is 89,480 sq.mi.; the population (1931 census, 310,933) was officially estimated at 337,521 in 1938, with East Indians and Negroes comprising 42% and 38% respectively. The chief cities are Georgetown (67,584) and New Amsterdam (9,514).

History.—During 1940 the legislative council voted, as an aid to the prosecution of the war in Europe, to forego the imperial grant-in-aid of $250,000. Voluntary contributions were made in excess of £42,500 to buy military aircraft for the empire.

In Sept. 1940 the "destroyer, naval and air-base agreement" between the United States and Great Britain made available to the former a site (to be selected later) within 50mi. of Georgetown for establishment and use as a naval and air base which, it was understood, would be at or close to the mouth of the Essequibo river.

Late in the year, United States experts visited the colony to select a site for the base. (*See* West Indies, British.)

Despite war conditions the program of economic development was continued during the year, with expenditures by the imperial government of nearly £190,000 for road construction to the gold and diamond fields, purchase of dredging equipment and geological surveys. A strong drive to make the colony more nearly self-sufficient in foodstuffs was pressed during the year.

Transportation.—There are 79mi. of railway, along the coast, 322mi. of main highway, and several important navigable rivers, which are, however, interrupted by falls and rapids. An aerial survey of water routes to the Rupununi district in the southern highlands was made in 1940, and several alternative plans for canalization around rapids submitted. Other proposed transportation projects to this area included a railway and a combined rail-water transit. Plans for settling European refugees in the area, which were in progress in 1939, were temporarily shelved owing to war conditions.

Agriculture, Mining and Manufacturing.—In 1939 imports (foodstuffs, manufactured goods and lumber) valued at 10,807,506 British Guiana dollars (a 1·7% increase over 1938) came largely from Great Britain (45·3%), Canada (18%), United States (14·3%) and British West Indies (4·3%). Exports (sugar products, 60%; bauxite, 19·6%; gold, 7·2%; rice, 31·9%; diamonds, 2·9%; balata, 1·4%) aggregating 14,525,780 British Guiana dollars, a 10·9% increase, were taken by Canada (50·9%), Great Britain (34·8%), United States (5·7%) and the British West Indies (5·4%). In the first four months of 1940, exports rose 35·5% in value, imports 55%. The export commodities are the principal products. The colony is the second largest sugar producer in the British empire, and one-third of the population derives its livelihood from sugar production. Forests cover 84% of the area. It is estimated that 19,000 sq.mi. of forest are readily accessible to exploitation. During 1940 considerable attention was given to possible pulp wood development.

Finance.—The monetary unit, the British Guiana dollar, normally equal to the U.S. dollar, was at approximately 17% discount during most of 1940.

Education.—There are 239 primary schools (1938 enrolment, 53,373) and seven secondary schools maintained at an annual cost of over $500,000. (L. W. Be.)

British Honduras, British crown colony in northern Central America; language, English; capital, Belize (pop. 16,687 in 1931); governor, Sir Alan C. Maxwell Burns. The area is 8,598 sq.mi. The population (1931 census: 51,347) was officially estimated at 58,759 as of Dec. 31, 1939. British Honduras's boundaries with Guatemala were settled by treaty in 1859; the question was reopened by the latter in 1939 and, in Jan. 1940, the British government offered to submit the matter to arbitration (*see* Guatemala).

Early in 1940 arrangements were made for the settlement of 80 European refugee industrial families at Ericatown in the west central highlands. They were expected to engage in specialized handwork.

The colony has direct maritime communication with New Orleans and Jamaica and, normally, with England. External air communication by a Mexican line to Mérida (Yucatan) connects with Pan American airways.

Domestic air service links Belize, British Honduras, with several interior points. In 1940 there were 25mi. of railway and more than 200mi. of motor transport.

British Honduras is an important trade intermediary between the Mexican territories of Yucatan and Quintana Roo and the United States, with re-exports valued at 1,138,081 British Honduras dollars in 1939. Total imports in 1939 (reported in British Honduras dollars) were $3,532,059 (a 12½% decrease), from the United States (32·5%), Mexico (27·6%, including re-exports) and Great Britain (15·9%). Total domestic exports were $1,381,-

593 (23·9% less than in 1938), nearly all to the United States (66·1%) and Great Britain (27·8%). From Jan. 1–June 30, 1940, imports decreased 15·7% over the corresponding period of 1939, while domestic exports and re-exports increased 16·7% and 35·7% respectively. The principal domestic exports are mahogany logs (31·52% in 1939), mahogany lumber (18·52%), bananas (13·51%), chicle (20·31%), grapefruit (5·91%) and coco-nuts (2·54%). These commodities, rice, sugar and corn grown largely for local consumption, are the principal products. The principal re-exports of Mexican origin are mahogany and chicle. In Sept. 1940, the British ministry of foods purchased the entire 1940 grapefruit crop, estimated at $100,000 in value.

The monetary unit, the British Honduras dollar, valued at 4.8665 to the pound sterling and normally equivalent to the U.S. dollar, was valued at 83 cents U.S. under exchange rates prevailing in 1940. The colony has 106 elementary schools, with a total enrolment of 10,021 in 1938 and five secondary schools, with an enrolment of 456. (L. W. Be.)

British Legion.

At the outbreak of war in 1939 the legion offered all its available resources to the government, and thousands of its members rejoined the forces while tens of thousands, both men and women, actively assisted the war effort in the home defence services, as guides at the London termini, in canteens and in other ways.

The removal of national headquarters from London to Richmond was much criticized by the metropolitan area conference in February, and as spiritedly defended by the chairman, Major Sir Francis Fetherston-Godley. At that time the criticism seemed to have some justification, but after-events left little doubt that the move was wise and saved the legion for its main purpose which, during 1940, it not only fulfilled but extended.

The queen was present at the women's section conference (April 17); at the annual national conference (May) Colonel A. S. Ashwanden succeeded as chairman and a resolution urging the suppression of the Peace Pledge union was carried unanimously after the meeting had been addressed by Dr. Benes, Gen. A. Lelong, French military attaché, M. Antoni Jazdzewski, counsellor to the Polish embassy, and the Norwegian minister, M. Colban.

The 1939 Poppy Day collection amounted to £537,699, and in June 1940 the *Poppy Annual* was issued on behalf of the Earl Haig Poppy Day fund.

British Medical Association.

Its peacetime activities largely suspended, the British Medical association concentrated during 1940 on the work of the Central and Local Medical War committees, which, planned by the association at the government's request before the war, supplied the doctors for the fighting services and for the civilian population, including the medical care of air-raid casualties, of unaccompanied children evacuated to the country, and of the public in air-raid shelters.

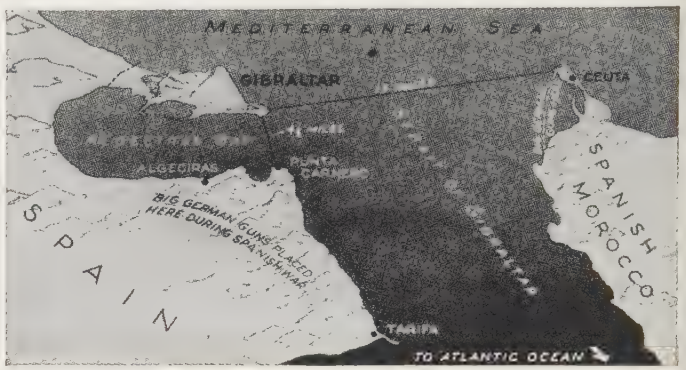
A Medical Planning commission, representative of all medical interests, was set up by the association during 1940 to study wartime developments and their effects on the country's medical services at the time and in the postwar era.

British Pacific Islands: *see* Pacific Islands, British.

British Possessions in the Mediterranean.

These comprise Cyprus, Gibraltar and the Maltese islands of which the table below gives certain statistics. The entry of Italy into the war in June 1940, followed by the collapse of France, brought the British possessions in the Mediterranean into the centre of hostilities.

All the women and children were evacuated from Gibraltar, and a number from Malta. The former city was subjected to some air raids, notably on Sept. 24 and 25 when French aircraft from Morocco dropped bombs in reprisal, it was stated in Vichy, for the attack on Dakar.



THE GREAT STRATEGIC IMPORTANCE of Gibraltar was enhanced after the fall of France in 1940. This map shows how it commands the western entrance to the Mediterranean

Raids on Malta by Italian aircraft were numerous, but the island was brilliantly and successfully defended by R.A.F. fighters and anti-aircraft batteries, while the fortitude and loyalty of the Maltese won general admiration. A number of its islanders were in 1940 serving in the royal navy.

Cyprus suffered less from the direct impact of the war, but active measures for defence were taken, and the news that Cypriots were the first colonists to serve in France led to the enlistment of thousands of volunteers.

Following the arrival of the new governor, W. D. Battershill, in Aug. 1939, a wartime economy for the island was immediately devised. In order to help agriculture, the basic industry of the island after mining activities contracted so much on account of shipping difficulties, the British government offered to buy the whole of the 1940 carob production, amounting to about £140,000 at a certain price, according to districts, which ensured, therefore, a minimum price for producers. Actually it appeared that by the play of competition local merchants were buying a large proportion of the crop at prices higher than those offered by the government, so that the latter would probably not have to take over such

British Possessions in the Mediterranean

Territory and Area in sq. mi.	Population (est. Dec. 31, 1938)	Principal Products 1938 (in metric tons)	Imports and Exports 1938 (in thousand £)	Road, Rail and Shipping 1938	Revenue and Expenditure 1938 (in thousand £)	Education, Elementary and Secondary 1938
Gibraltar, 1⅞ .	20,139	. .	free port: no statistics kept	shpg. cleared, 13,748,978 tons net	rev. 208 exp. 200	elem. schools 13; scholars 2,714; sec. schools 4; scholars 450.
Malta, 122 . . .	268,668	potatoes, 28,400 wheat, 8,100	imp. 3,866 exp. 219 re-exp. 468	rds. Malta 267 mi. Gozo 68 mi.	(est. 1939–40) rev. 1,524 exp. 1,517	1939 elem. schools 82; scholars 29,007; sec. schools 6; scholars 1,348
Cyprus, 3,572 . .	376,529	wines, 226,801 hectolitres pyrites 501,484	imp. 2,267 exp. 2,391	rds. 862 mi. rlys. 71 mi.	rev. 1,023 exp. 908	elem. schools: Christian 492; Moslem 212; scholars: Christian 37,646; Moslem 7,493; sec. schools 34; scholars 4,463.

a large proportion of the crop as was at first anticipated. The government also planned to buy the raisin crop, amounting to about £50,000.

The island had many problems ahead. Its important export and import trade suffered through the restrictions in the Mediterranean, but it was hoped that the government would give the necessary assistance to producers of other major products. It was, moreover, possible in spite of war conditions to continue with work on anti-erosion, and with the rural development scheme initiated in 1936.

Generous contributions were made by all the islands to funds for fighter planes and mobile canteens. (A. Mn.)

British Somaliland: *see* British East Africa.

British South African Protectorates.

Under this heading are grouped the British protectorates in the south of Africa, of which certain essential statistics are given in the table. *See* British Empire for population, capital towns, status and governors. For other territories of the British empire in the south of Africa, *see* South Africa, Union of.

British South African Protectorates

Territory and Area in sq. mi.	Principal Products 1938 (in metric tons)	Imports and Exports (in thousand £)	Road, Rail and Shipping 1938	Revenue and Expenditure (in thousand £)	Education: Elementary and Secondary
Basutoland 11,716	wheat, 23,384; maize, 791,352	(1939) imp. 866.4 exp. 405.5	rds. 502 mi.	(1939–40) rev. 374; exp. 354	(1939) Elem. schls. 848; other schls. 69; total schlrs. 81,348
Bechuanaland c. 275,000	gold, 19,111 oz.; silver, 1,127 oz.	(1938) imp. 361 exp. 376	rds. 2,048 mi. rly. 396 mi.	(1938–39) rev. 190; exp. 203	(1937) schls.: Europn., 12; coloured, 2; native, 117.
Swaziland 6,705	gold, 1,246 oz.; tin, 174 tons	(1938) exp. 116	rds. 654 mi.	(1938–39) rev. 115; exp. 161	(1937) Europn.: schls., 7; schlrs.,354; schlrs. at native schls., 4,975; coloured: schls. 1; schlrs., 38

History.—As in other parts of the British commonwealth, so in the three South African territories—Basutoland, Bechuanaland and Swaziland—1940 was a year of war effort. Nowhere was there a stronger sense of loyalty to the common cause. In all three territories the desire to take part in the actual fighting was only checked by the lack of local facilities for training and equipment. Equally striking was the eagerness of these poor and backward little countries to make their contribution to the economic and financial sinews of war. A campaign for growing more foodstuffs was set on foot and many acres of untilled land were put under the plow. Increases in taxation were willingly accepted by the chiefs and their peoples. Expenditure was drastically curtailed. As a result, the amount of the "grant-in-aid" voted by the British parliament to assist the strained finances of Bechuanaland was reduced by £22,000. Basutoland, which is better off than the other two territories but needs all her funds in ordinary times to conserve and develop her mountain soil, actually made a gift of £100,000 to the British government. In all three territories, moreover, war funds were opened for private subscription on the outbreak of war; and, by the autumn of 1940, the sums remitted from those funds to the British government or various war organizations in Britain amounted to over £30,000. (R. Co.)

British West Africa.

Under this heading are grouped the British colonial territories on the west coast of Africa, for which certain essential statistics are given in the table on this page. *See* British Empire for population, capital towns, status and governors. (X.)

History.—The record of British West Africa in 1940 was necessarily a war-record, and its outstanding feature was the manner in which, in all its four territories, Nigeria, Gold Coast, Sierra Leone and Gambia, the popular enthusiasm for the cause for which they were fighting as units of the British commonwealth was not only sustained but grew stronger as the months went by. When France collapsed in the summer, there was no whisper of "defeatism." On the contrary, from all the territories came renewed declarations of loyalty to the common cause.

This universal response to the call of the war took concrete shape in three main ways. First, the stream of recruits for military service was steadily maintained. Thus the royal West African frontier force, which in peace time only numbered about 5,000 officers and men (320 British) was substantially strengthened, and it proved possible to send units of it from Nigeria and the Gold Coast to join the forces gathering in Kenya for the defence of British East Africa from Italian attacks. Secondly, the British West Africa peoples not only willingly accepted increases of taxation, but contributed, both through their governments and by private gifts, to the various war funds of Britain sums which by the autumn had already reached a total of £450,000. Thirdly—and this was British West Africa's most important contribution to the war—measures were taken not only to prevent the economic resources of the four colonies from being tapped by the axis powers, but also to expand by increased cultivation and intensified mining the amount of raw materials available for Britain. Among the chief products of this area are ground nuts, palm kernels and palm oil, all of the highest value both for foodstuffs, such as margarine, and for lubrication. The Gold Coast and Nigeria grow 45% of the total world supply of cocoa. The output of tin from Nigeria is nearly one-fifth of that from Malaya. The Gold Coast is the third

British West Africa

Territory & Area in sq. mi.	Principal Products exports (in tons)	Imports & Exports (in thousand £)	Road, Rail & Shipping 1938	Revenue & Expenditure (in thousand £)	Education: Elementary & Secondary 1938
Nigeria (including British Mandate of Cameroons) 372,674	(1938) palm kernels 312,048; ground nuts 180,136	(1938) imp. 8,632; exp. 9,461	rds. 13,690 mi. shpg. cleared 2,012,498 net tons	(est. 1940) rev. 6,221; exp. 6,477	(1937) elem. schools 543; scholars 24,630.
Gold Coast (including Ashanti, Northern Territories and British Mandate of Togoland) 91,843	(1938) cocoa 263,229; gold 677,480 fine oz.	(1938) imp. 10,380; exp. 11,080	rds. 2,270 mi. rly. 500 mi. shpg. cleared 2,404,898 net tons	(1938–39) rev. 3,780; exp. 3,489	elem. schools 927, scholars 83,824; sec. and higher educ. scholars 2,078
St. Helena (47) and Ascension Islands (34)	(1938) flax fibre 284; tow 199	(1938) imp. 38; exp. 7	rds. 45 mi.	(est. 1939) rev. 16; exp. 15	812 scholars
Gambia 3,999	(1939) ground nuts (total) 46,981; palm kernels 681	(1938) imp. 406 exp. 256	rds. 869 mi. shpg. cleared 567,966 net tons	(1938) rev. 167; exp. 263	elem. schools 13; scholars 1,963; sec. schools 4, scholars 197
Sierra Leone 27,926	(1939 ([value]) diamonds £644,100; iron ore £650,325	(1939) imp. 1,667 exp. 2,207	rds. 922 rly. 310 shpg. entered 2,725,783 tons	(est. 1939) rev. 809; exp. 940	elem. schools 253; scholars 20,851

largest producer of manganese in the world. In stimulating the production of these and other commodities needed for the war the British government played the part of purchaser. It bought the whole of the year's cocoa crop at a price roughly £2 per ton higher than the average price of 1938–39. It bought the Nigerian output of ground nuts, palm oil and palm kernels. These purchases helped compensate for loss of other foreign markets. (R. Co.)

British West Indies: *see* West Indies, British.
Broadcasting: *see* Radio, Industrial Aspects of; Radio, Scientific Developments of.

Brooke, Sir Alan Francis (1883–), British soldier, was born at Baguères de Bigorre, France, on July 23, the son of Sir Victor Brooke. After completing his studies at the royal military academy, Woolwich, he joined the royal field artillery in 1902. He was stationed in Ireland from 1902 to 1906, then India. At the outbreak of war in 1914 he went to France, where he commanded an ammunition column. Advancing rapidly, he was soon recognized as a foremost British authority on artillery and was a general staff officer of the royal artillery at the time of the armistice. After the war he joined the staff college, Camberley, and the imperial defence college, and from 1929 to 1932 he was commandant of the school of artillery. After duty at various other military posts he was appointed in 1939 commander-in-chief of the anti-aircraft command.

When Germany invaded the Low Countries on May 10, 1940, Brooke was commander of the B.E.F. 2nd corps in France. His brilliant guarding of the British retreat from Flanders was an important factor in the successful evacuation at Dunkirk. Back in England early in June, he hastily reassembled British military manpower for the expected nazi invasion and prepared a formidable series of defence zones. For his work in Flanders he was knighted, and on July 19 he was appointed to succeed Sir Edmund Ironside as commander-in-chief of home forces.

Brookings Institution. The research program carried on at the Brookings institution during the calendar year 1940 included studies of many important problems in the fields of economics and government. Among those completed were the following: *Federal Control of Expenditures,* by Fred W. Powell, a compilation of material underlying the nation's financial history prior to 1894; *Labor Relations in the Automobile Industry,* by William H. McPherson, a study of the development of union organization; *The Federal Financial System,* by Daniel T. Selko, a study of the problems of government financing; *Wartime Control of Prices,* by Charles O. Hardy, an analysis of the factors involved based on the nation's experience in the World War of 1914–18; *Union Policies and Industrial Management,* by Sumner H. Slichter, a study of the evolution of shop rules and practices under which labour and management have developed an orderly system of labour jurisprudence; *How Nazi Germany Has Mobilized and Controlled Labor,* by L. Hamburger, an analysis of the growth of labour regimentation; *Federal Regulatory Action and Control,* by Frederick F. Blachly and Miriam E. Oatman, an investigation of the operation of federal administrative and quasi-judicial agencies; *Government and Economic Life,* vol. ii, by Leverett S. Lyon, Victor Abramson and associates, the concluding volume of a study of the relationship of government to private enterprise.

Twenty fellowships for work in the social sciences were granted to advanced graduate students for 1940–41. (H. G. Mo.)

Brunei: *see* Borneo.

Brush, Matthew Chauncey (1887–1940), U.S. corporation official, was born in Stillwater, Minn., and was graduated from the Massachusetts Institute of Technology in 1901.

That year he was employed by the Union Pacific Railroad Company as a machinist. In 1904 he was employed by the street railroad company of Newton, Mass., and later by the street railroad system in Buffalo. In 1910 he was made assistant to the vice-president of the Boston elevated railroad, rising to the presidency in 1916. He was president of the American International Shipbuilding corporation at Hog Island, Pa., from 1918 to 1921. At the same time he was connected with the American International corporation, an investment trust of which he became president in 1923. He died in New York city Oct. 15.

Bryn Mawr College. Bryn Mawr college is a resident college for women at Bryn Mawr, Pa. The 1940–41 enrolment of 654, the largest in the college's history, includes 152 graduate students and 502 undergraduates. The faculty and teaching staff number 102. In Oct. 1940, the Quita Woodward wing of the library was opened. This increases the stack space of the library by one-third, and adds a recreational reading room, an art gallery, an archaeological museum, art classrooms, seminaries and offices. The Mary Paul Collins scholarship for foreign women, awarded in the furtherance of a research project in the graduate school, was offered in 1940 in anthropology, and the project is on the subject of religion as a projection of the social order. The Anna Howard Shaw lectures, given by a visiting lecturer, were also in the field of anthropology in 1940. (M. E. Pa.)

Buchan, John: *see* Tweedsmuir, 1st Baron, of Elsfield.

Buckwheat. The 1940 crop of buckwheat was the second smallest of record in the U.S. and was reported by the department of agriculture in Oct. 1940 as 6,048,000bu., compared with 5,739,000bu. in 1939, which was the smallest crop in 75 years. The ten-year average production (1929–38) was 7,617,000 bushels. For ten years (1931–40) U.S. farmers planted smaller acreages to buckwheat than formerly.

The average yield per acre in 1940 was 16·2bu., compared with 15·1bu. in 1939.

Estimated Production in U.S. of Buckwheat by States, 1940 and 1939

	1940 bu.	1939 bu.		1940 bu.	1939 bu.
New York	2,186,000	2,077,000	North Carolina	56,000	56,000
Pennsylvania	1,824,000	1,808,000	Vermont	46,000	46,000
Michigan	272,000	247,000	Iowa	42,000	36,000
Ohio	234,000	192,000	New Jersey	36,000	18,000
West Virginia	224,000	248,000	Tennessee	24,000	21,000
Indiana	210,000	168,000	Kentucky	24,000	16,000
Virginia	195,000	182,000	Illinois	15,000	16,000
Minnesota	182,000	188,000	Delaware	12,000	11,000
Wisconsin	182,000	162,000	North Dakota	10,000	11,000
Maine	152,000	117,000	Missouri	10,000	10,000
Maryland	102,000	100,000	South Dakota	10,000	9,000

(S. O. R.)

Budgets, National. A national budget sets forth the expenditures and receipts of the government and a balanced statement showing the condition of the government's finances at the end of each period. For example, in the United States the Budget and Accounting act of 1921 provided for a national budget system and created a bureau of the budget to prepare for the president the budget of the United States government. The act directs the president to submit to congress on the first day of each regular session a budget which presents the expenditures and receipts of the federal government for the fiscal year just completed, estimated expenditures and receipts

for the current and ensuing fiscal years and balanced statements showing the condition of the treasury at the end of each of these periods. The budget document also includes discussion of the financial condition of the government and recommendations on the many aspects of government fiscal policy.

The budgets of all the major world powers and of many smaller nations were in 1940 geared to the requirements of modern war or national defence. Expenditures for military and naval purposes dominated the outlays of these budgets, and, since expenditures were not financed entirely from revenues, most national budgets showed huge deficits. New taxes were imposed, of substantial magnitude in many cases, but in most countries it was thought inexpedient or undesirable to meet total government requirements by taxation. These deficits will in all likelihood continue to increase until destructive and chaotic world conditions are terminated. And even if peace were achieved it is not certain that world economic conditions would be such as to make balanced budgets possible for most countries.

It will be necessary to make the transition from a war economy to a peace economy, to put soldiers back to work in private industry and once again to shift industry from the production of armaments to the production of civilian goods and services. This transition will be difficult and will require great skill and ingenuity even with the aid that can be given by the financial resources of government. Without those resources the adjustment would undoubtedly entail considerable economic and social disorganization.

United States.—During its 20-year history the federal budget of the United States has mirrored the changing role of the government in the economic and social life of the nation. In the years immediately following its inception, the budget was conceived primarily as a device for predetermining that estimated revenues in the coming year would cover contemplated expenditure and, perhaps, allow some liquidation of the national debt. While it was recognized by some economists and others that government fiscal operations could influence general economic conditions, considerations of this nature did not enter into budget making. The government's budget was thought to be similar to an individual's —it assisted in the allocation of revenues to most useful functions and in revealing functions upon which economies could be effected. In the prevailing economic ideas of the day, such control of general economic conditions as might be necessary was thought to be a responsibility of the central banking system, operating through its traditional instruments of monetary policy.

This conception of budget policy sufficed for the almost continuous prosperity of the postwar decade. Even with the onset of the economic depression in late 1929, these ideas were dominant. The budget became unbalanced after 1930 because government revenues declined drastically as the national income fell off, rather than through any act of budgetary policy. The Federal Reserve system attempted to stem the deflation by lowering the banks' rate of interest and by engaging in extensive open market operations. Despite these and other measures business continued to sink deeper into depression and the government deficit continued to mount.

In its early days the administration of Franklin D. Roosevelt followed essentially the fiscal policy of the preceding regime; in fact, it applied the conventional budgetary ideas more drastically, for one of its first official actions was a sharp cut in many items of government expenditure in an effort to bring the ordinary budget closer into balance. As the inventory boomlet of the summer of 1933 failed to blossom into real economic recovery, however, the administration abandoned fiscal orthodoxy and embarked upon what became a new conception of the role of government fiscal policy under conditions of economic depression. This policy was the use of government spending to provide re-em-

"ANOTHER PLOW-UNDER," by Elderman of the *Washington Post*

ployment. It was soon recognized to involve an unbalanced budget as a stimulus to economic activity. In the years that followed, every budget contained substantial sums for such items as work projects, power facilities, public highways, schools, recreation facilities, public buildings and others.

The budgets from 1934 on differed from those of previous years in another important respect. They reflected the many new social responsibilities undertaken by the federal government during these years, some of which represented functions formerly assumed only by state and local government units and others of which were entirely new to government in this country. In consequence, the budget came to contain provisions for relief, social security, railroad retirement, slum clearance, aids to youth and other activities.

What the changes wrought by the New Deal meant in the economic and social life of the nation is suggested by a comparison of the budget before 1933 with some later year. For example, in the fiscal year 1931 federal government expenditures totalled approximately $3,671,000,000, whereas in 1939 the total was $8,707,000,000. In part this rise was due to increased outlays for functions and expenses existing in 1931, such as national defence, the legislative, judicial and civil establishments, public highways, improvement of rivers and harbours, flood control, interest on public debt, etc. In the main, however, it resulted from the new activities of the federal government, such as the Agricultural Adjustment program, $782,000,000; social security, $374,000,000; railroad retirement, $110,000,000; Tennessee Valley authority, $41,000,000; grants to public bodies for public works, $379,000,000; direct relief, $104,000,000; work relief (WPA, etc.), $2,283,000,000; and the Civilian Conservation Corps, $290,000,000. Expenditures for these items in the fiscal year 1939, totalled $4,363,000,000.

Concurrently with this rise in expenditures there was an increase in government revenues derived from various new taxes, higher rates on existing taxes and increased receipts flowing

from the general expansion of economic activity. By 1939 total revenues had expanded to $5,667,824,000, in contrast to the 1931 total of $3,189,639,000. The net deficit, therefore, rose considerably less than expenditures; the deficit was $481,000,000 for the fiscal year 1931 and $3,542,000,000 for the fiscal year 1939. It was, perhaps, partially because of the new importance of the federal budget in the national economy, and the fact that it must reflect the economic and social policies of the president, that the bureau of the budget was transferred in 1939 from the treasury department to the executive office of the president. In 1940 economic experts were added to the staff of the budget bureau, suggesting that the problem of budget making was viewed as co-ordinate with the fiscal requirements of the economic situation.

Table I.—*Budget Statement Sent to Congress by Pres. Roosevelt Jan. 8, 1941*

General and Special Accounts

	Est., Fiscal Year 1942	Est., Fiscal Year 1941	Actual, Fiscal Year 1940
I. Receipts:			
1. Revenues:			
Internal revenue	$8,500,135,000	$6,817,210,000	$5,203,133,988.29
Railroad Unemployment Insurance Act	7,200,000	6,800,000	4,918,040.78
Customs	295,000,000	302,000,000	348,590,635.21
Miscellaneous revenues	161,438,830	158,030,305	162,454,931.73
Total revenues	$8,963,773,830	$7,284,040,305	$5,819,097,596.01
2. Realization upon assets:			
Return of surplus funds from government corporations	..	360,500,000	..
Other	7,961,170	8,669,695	105,738,806.75
Total receipts	$8,971,735,000	$7,653,210,000	$5,924,836,402.76
Deduct net appropriation for Federal old-age and survivors insurance trust fund	696,300,000	640,280,000	537,711,733.00
Net receipts	$8,275,435,000	$7,012,930,000	$5,387,124,669.76
II. Expenditures:			
1. Legislative, judicial and executive	$41,328,200	$38,546,168	$36,704,687.17
2. Civil departments and agencies	956,028,287	965,154,202	952,248,927.17
3. General public works program	502,884,000	570,002,000	540,785,326.45
4. National defence	10,811,314,600	6,463,923,900	1,579,905,425.73
5. Veterans' pensions and benefits	564,570,000	560,110,000	550,692,391.13
6. Aids to agriculture:			
Gross expenditures	1,061,561,700	1,106,391,800	1,375,062,905.68
Return of surplus funds from government corporations	..	*315,000,000	..
7. Aids to youth	362,590,000	369,325,000	377,893,084.34
8. Social security	462,520,000	430,279,900	383,615,113.02
9. Work relief:			
Gross expenditures	1,034,139,700	1,501,915,000	1,861,421,985.35
Return of surplus funds from government corporations	..	*24,500,000	..
10. Refunds	89,006,300	70,008,000	91,070,763.72
11. Interest on the public debt	1,225,000,000	1,100,000,000	1,040,935,696.71
12. Transfers to trust accounts	274,585,262	216,215,000	207,853,400.00
13. Supplemental items—regular	100,000,000	150,000,000	..
Total expenditures, excluding debt retirement	$17,485,528,049	$13,202,370,970	$8,998,189,706.47
III. Net deficit	$9,210,093,049	$6,189,440,970	$3,611,065,036.71
IV. Debt retirement	$100,000,000	$100,000,000	$129,184,100.00
V. Gross deficit	$9,310,093,049	$6,289,440,970	$3,740,249,136.71
VI. Means of financing deficit:			
1. Net decrease in working balance on general and special account	..	..	$1,083,066,410.14
2. Borrowings:			
Replacing debt retirement	$100,000,000	$100,000,000	129,184,100.00
Increasing the public debt	9,210,093,049	6,189,440,970	2,527,998,626.57
Total, means of financing	$9,310,093,049	$6,289,440,970	$3,740,249,136.71

*Excess of credits, deduct.

As originally submitted by the president to congress, the federal budget for the fiscal year 1941 did not differ in its essentials from the actual receipts and expenditures of the fiscal year 1940, as shown in Table I. With the necessity for an enlarged national defence establishment demonstrated by the war in Europe, however, that proposed plan of government operations was drastically altered. A huge defence program was quickly outlined and passed by congress; before the end of 1940, $22,371,405,000 in appropriations and contract authorizations were written into law. Two revenue acts were also passed which raised various tax rates and imposed an excess profits tax. As a result of these measures it was estimated in 1940 that total government expenditures in the fiscal year 1941 would be $13,202,370,970, in contrast to actual outlays of $8,998,189,706 for the fiscal year 1940. National defence expenditures were expected to rise to $6,463,923,900 from $1,579,905,425 over the same period, the total of all other items thus declining by almost $700,000,000. Despite an increase in revenues estimated at almost $1,500,000,000, the net deficit for 1941 was expected to be $6,189,440,970, as against $3,611,065,036 for 1940. The full magnitude of the defence effort toward which the nation was directing its energies, however, remained the keynote of the budget submitted by the president for the fiscal year 1942, shown in Table I. A national defence expenditure of $10,811,314,600 was anticipated and this sum did not include whatever aid might be given to other democratic nations in their struggle against the totalitarian powers. This will be by far the largest peacetime expenditure for the armed forces in the history of the country and not far short of the 1914–18 World War expenditure at its peak in 1919.

Entirely as a result of this tremendous national defence outlay, the total expenditures of the government in 1940 were expected to rise to $17,485,528,049. This figure, too, was the largest in U.S. peacetime history and approached the 1919 total of $18,522,895,000. A reduction in the total of all other than defence expenditures was recommended by the president, in view of the improvement in general economic conditions already assured at the time. While the existence of certain fixed obligations of the government and commitments of congress necessitated the maintenance of various items of expenditures, a 15% curtailment in outlays for other activities was proposed. The reduction in the budget for these activities amounted to $600,000,000, affecting primarily the Work Projects administration, non-defence public works and the agricultural program.

On the revenue side of the budget it was estimated that government receipts would total almost $9,000,000,000 in the fiscal year 1942, an increase of $3,000,000,000 over the revenue collected in the last year before the start of the defence program—the fiscal year 1940. Half this increase was to come from the new defence taxes enacted by congress, the other half from the rise in receipts which is always produced by an expansion of the national income. As the increase in expenditures would be considerably larger than the increase in revenues, the net deficit was calculated at $9,210,093,049, a rise of more than $3,000,000,000 over the previous fiscal year.

The president recommended that this deficit be financed primarily through borrowing because he feared that drastic and restrictive taxation would interfere with the full use of the na-

tion's productive resources. Furthermore, he pointed out that revenues from existing taxes would continue to rise in 1943 and partially reduce the deficit. However, it was suggested that a start be made in meeting a larger percentage of defence payments from current tax receipts by the imposition of additional tax measures based on the principle of ability to pay.

The budget of the United States as it was presented in 1940 did not differentiate the operating expenses of the federal government from its expenditures of an investment character. Hence, it is difficult to determine whether a deficit in any particular year represents an addition to the wealth of the nation or merely the financing of operating expenditures by debt creation. From 1931 to 1941, for example, the total expenditure on public works projects, such as roads, school buildings, airports, dams, post offices and administrative buildings amounted to $8,800,000,000. Most, if not all, of these public works were of a durable character which have a life far beyond the years during which the expenditures were made. In this period a total of $14,600,000,000 was spent on work relief and the Civilian Conservation corps and a good portion of these expenditures also resulted in the construction of projects of a durable type. In the federal budget expenditures for such durable projects are included in the determination of the deficit or surplus for the year.

This procedure differs from the treatment of capital outlays in the accounting statements of private business enterprises. A corporation deducts only depreciation on capital assets each year, rather than the total cost of the asset in the year when constructed or purchased. It has been suggested that the federal government adopt a similar procedure, including in its operating expenses for the year none of the addition to durable assets, but rather a derived figure equivalent to the amortization allowance on durable assets for the year. This procedure, known as the double budget, would involve setting up separate accounts for operating and for investment expenditures. When the expenditures for durable assets during the year were large, this procedure would have the effect of showing a smaller deficit than would be shown by 1940 budget methods. Over a long period of years, however, the total deficit would be the same.

This method of government accounting has been employed in Sweden, where the government was confronted with the financial problems arising from the undertaking of a heavy public works program. For details of the system employed by the government of Sweden and its possible application to the United States, *see* the articles in *Fortune Magazine* of Sept. 1938 and April 1939. Whether the double budget system can be successfully applied to the United States government financial accounts remains a question.

It has been suggested that a double budget be set up by separating all defence expenditures from other expenditures of the federal government. This type of double budget should not be confused with the one described above, for it is not based on the segregation of durable assets, but rather on the idea that the defence expenditures are of an emergency character and hence not to be confused with the regular expenditures. (*See* also NATIONAL DEBTS; NATIONAL INCOME; UNITED STATES.) (M. GT.)

Great Britain.—Two budgets for the financial year 1940–41 were presented during the summer of 1940. The estimates of revenue and expenditure will be found in the table, but the actual expenditure for the year depended on the course of the war and so both estimates must be regarded as provisional. As they stand, the April budget left a deficit of £1,432,000,000 and the July supplementary budget one of £1,106,000,000. The later figure shows the gap to be covered by borrowing.

Defence and war expenditure rose from £400,000,000 in 1938–39, the last complete prewar year, to £1,141,000,000 in 1939–40.

Table II.—*British Budget, 1940*

Expenditure

(£ millions)

	Actual 1938–39	Actual 1939–40	April Budget Estimate 1940–41	July Budget Estimate 1940–41
Interest and management of debt	216.8	222.9	230.0	230.0
Sinking funds	13.2	7.1	..	..
Other consolidated fund services	14.3	16.9	17.0	17.0
Defence and war expenditure*	400.2	1,141.4	2,000.0	2,800.0
Civil and revenue votes	423.5	428.6	419.8	419.8
Total expenditure	1,068.0	1,816.9	2,666.8	3,466.8

*Includes issues from loans.

Revenue

	Actual 1938–39	Actual 1939–40	April Budget Estimate 1940–41	July Budget Estimate 1940–41
Income tax	335.9	390.1	450.5	510.5
Surtax	62.5	69.8	75.0	83.0
Estate duties	77.4	77.7	85.1	86.1
Stamps and other inland revenue	22.5	18.4	20.0	20.0
Nat. Def. contribution	21.9	26.9	70.0	70.0
Excess profits tax	..	..		
Customs	226.3	262.1	302.0	309.2
Excise	114.2	137.9	164.0	213.6
Motor vehicle duty	35.6	34.1	35.0	35.0
Post office, net	9.5	3.8	13.3	13.3
Other non-tax revenue	21.5	28.4	19.5	19.5
Total revenue	927.3	1,049.2	1,234.4	1,360.2

The latest estimate is £2,800,000,000 and the latest estimate for total expenditure is £3,467,000,000.

In his April budget Lord Simon, then chancellor of the exchequer, confirmed the raising of the standard rate of income tax from 7*s.* to 7*s.* 6*d.* in the £ and also the reductions in allowances for income tax—all of which had been announced in advance by him when he opened his Sept. 1939 war budget. Surtax rates were left unchanged, but the surtax exemption limit was reduced from £2,000 to £1,500 a year, to take effect in the financial year 1941–42. The beer duty was increased by 1*d.* a pint, the spirits duty by 1*s.* 9*d.* a bottle, and the tobacco duty by 3*d.* an ounce. The match duty was doubled. Heavy increases were also made in postal rates. The inland letter postage was increased from 1½*d.* to 2½*d.* and post cards were raised from 1*d.* to 2*d.* Increases were also made in telegraph and telephone charges. Finally the chancellor announced in general terms his intention to impose a purchase tax, together with the introduction of a new measure to limit company dividends to their prewar rates. During the summer the excess profits tax was raised from 60% to 100%. Thus all excess war profits accrued to the exchequer, and so the proposal to limit dividends became redundant and was dropped.

By July it was clear that the cost of the war had been underestimated, and so a new budget was introduced by Sir Kingsley Wood, who by then had succeeded Lord Simon at the exchequer. This budget raised the standard rate of income tax from 7*s.* 6*d.* to 8*s.* 6*d.*, and the reduced rate on the first £165 of taxable income from 3*s.* 9*d.* to 5*s.* Surtax rates were raised by 9*d.* on incomes from £2,000 to £15,000 and by 6*d.* on higher incomes. Death duties on estates over £10,000 were increased by 10%. A further 1*d.* a pint on beer and 3*d.* an ounce on tobacco was imposed, together with higher duties on light wines.

Finally details of the new purchase tax were announced. This was to be 33⅓% on luxuries and 16⅔% on seminecessities. Food, drink, children's clothing, fuel, light and commodities already taxed were to be exempt. The tax was to be imposed as goods passed from the manufacturer or wholesaler to the retailer, and was estimated to add 24% or 12%, as the case may be, to the retail prices of commodities subject to it. The estimated yield was £40,000,000 in 1940–41, and £110,000,000 in a full year. The tax was to be included under excise duties.

The July budget increased prospective revenue for 1940–41 by £126,000,000, but taking the two budgets together, the total in-

crease in taxation was from actual receipts of £1,049,000,000 for 1939–40 to prospective receipts of £1,514,000,000 for 1941–42. This latter figure would doubtless be increased by higher taxation in the budget of 1941. (N. E. C.)

Building and Building Industry.

The building industry of the United States continued its slow revival during the early months of 1940, increasing its pace after the middle of the year under the direct and indirect stimulus of the national defence program. The greatest increase was in nonresidential, chiefly industrial building. In the residential field the U.S. department of labour's preliminary estimate was 545,000 new urban dwelling units for 1940, which was better than the 1929 figure, though by no means equal to the need. The figure for 1939 was 465,000.

Table I.—*Permit Valuation of Building Construction in Reporting U.S. Cities With a Population of 1,000 and over, First 11 Months of 1939 and 1940, by Class of Construction*

Class of Construction	January-November, Inclusive		Percentage Change
	1940	1939	
All classes	$2,258,852,079	$1,920,244,909	+17.6
New residential	1,172,436,744	1,039,615,935	+12.8
New nonresidential	773,131,977	559,092,714	+38.3
Additions, alterations and repairs	313,283,358	321,536,260	− 2.6

Table prepared by the Division of Construction and Employment of the U.S. Bureau of Labor Statistics.

The Federal Housing administration continued to be an important factor in the stimulation of private residential building through its insurance of mortgages. Preliminary estimates indicate that during 1940 the value of mortgage loans insured by it totalled $1,023,000,000, of which $592,000,000 represented new construction, $254,000,000 repairs and modernization, and $177,000,000 refinanced mortgages on existing homes. Approximately 180,000 new units were started under FHA inspection during the year.

The Federal Home Loan Bank system reported that during 1940 $360,000,000 was lent by its member institutions for the construction of new homes. The year showed a wholesome tendency to cater to the unsatisfied demand for low-priced houses, which, however, sometimes had to encounter the organized hostility of neighbouring property owners. Single-family units continued to be the predominant type and, except as provided by public agencies, were almost exclusively for sale. FHA insurance for large-scale rental projects in the middle price range produced only 4,000 family units during the year, and even those were nearly all apartments.

Table II.—*Number of Families Provided for in New Residential Construction in 257 Identical Cities, 1921 to 1940*

Year	Families Provided for	Year	Families Provided for	Year	Families Provided for
1921	224,545	1928	388,678	1935	55,490
1922	377,305	1929	244,394	1936	114,789
1923	453,673	1930	125,315	1937	117,323
1924	442,096	1931	98,158	1938	157,104
1925	491,032	1932	27,380	1939	203,625
1926	462,208	1933	25,885	1940*	228,250
1927	406,095	1934	20,952		

*Preliminary figure.
Table prepared by the Division of Construction and Employment of the U.S. Bureau of Labor Statistics.

The reluctance of private enterprise to build low or medium rental housing seemed likely to produce one of the most acute problems in the national defence program. For it appeared fairly obvious that if the risk of loss because of the temporary character of defence industries is too great for business men to assume, government can hardly permit the unloading of that risk on the shoulders of individual workers through pressure-induced home purchase. Rise in building costs was not spectacular in 1940, but the trend was upward. Responsible leaders of the industry warned against large price increases and against "boom psychology."

BIBLIOGRAPHY.—Publications of the U.S. Bureau of Labor Statistics; Bureau of Foreign and Domestic Commerce; National Resources committee; Federal Home Loan Bank board; Federal Housing administration; F. W. Dodge corporation; National Bureau of Economic Research.
(E. E. Wo.)

Great Britain.—During 1940 the building industry in Great Britain had to contend with exceptional difficulties owing to the fluctuations in the war situation.

Increased pressure was placed upon its resources in the latter part of June, arising from the collapse of France and the necessity for the immediate provision of vital coastal defence works in addition to an ever increasing number of buildings of all kinds for military accommodation. Intensive bombing attacks increased this pressure by creating a demand for additional air raid precautions works and the reparation of damaged buildings. Both military and civil defence works were, for practical purposes, localized throughout the country.

The new control of private building enterprise order, which was shortly to come into operation, should not have seriously affected the industry, as there had been an almost complete cessation of private building.

The effect of this widespread public building program was more than sufficient to absorb most of the available labour and material resources of the building industries. By the closing months of 1940 the position had been reached when the relationship between the demands on them, and their resources, had to be planned and made infinitely more orderly if the economic best from this great group of industries was to be obtained. The long-anticipated ministry of building had arrived and, although its personnel and structure were at this time unknown, it could be sure in advance of the fullest co-operation of the building industries in the co-ordinated utilization of all their resources. Expansion of the export trade to its utmost capacity was held to be vital as a means of reducing the adverse trade balance. With this object in view an export group for the constructional industries was formed to develop overseas trade in fittings and components. Manufacturers and contractors concerned with this activity were most likely to succeed by a co-ordinated sales effort through co-operative selling groups. (*See* also HOUSING; UNITED STATES: *Housing.*) (N. KE.)

Bukovina: *see* MINORITIES; RUMANIA; UNION OF SOVIET SOCIALIST REPUBLICS.

Bulgaria.

A kingdom in the Balkans, comprised in Jan. 1940, an area of 39,814 sq.mi., with a population of about 6,370,000. As a result of the treaty of Crayova on Sept. 7, 1940, Bulgaria acquired from Rumania the Southern Dobruja, and added thus *c.* 2,900 sq.mi., with a population of 350,000, to her territory. After this success, Bulgaria continued to demand the cession of parts of Macedonia from Yugoslavia, and access to the Aegean sea with the port of Dédéagatch from Greece, but at the end of 1940 these claims remained unfulfilled.

In its governmental set-up, Bulgaria continued the regime established by the royal *coup d'état* of May 19, 1934, by which parliamentary rule was reduced to a shadow and the real power passed into the hands of the king, Boris III, who exercised his authority through cabinets of his own choice. All political parties were abolished, and the elections were held under strict governmental control. The population, the large majority of whom are peasants of the lower income groups with very definite demo-

cratic leanings and with a strong sympathy for the great Slav "brother," Russia, resented the dictatorship, especially in view of the fact that the king, himself of German descent and married to an Italian princess, and the court favoured the axis powers. At the outbreak of the European war in 1939 Bulgaria had declared a policy of strict neutrality, but with the growing successes of the axis Bulgaria inclined more and more towards a pro-German policy, through which she also hoped to satisfy her territorial aspirations. Economically Bulgaria soon passed entirely under German control. Although she accepted many aspects of fascist policy, including the introduction of the first anti-Semitic legislation in Bulgaria's history, nevertheless she did not join the axis alliance officially. King Boris visited the German chancellor on Nov. 17, but the expectation that Bulgaria would follow Hungary, Rumania and Slovakia in signing the Berlin-Rome-Tokyo pact was not by Jan. 1, 1941 fulfilled.

The energetic resistance shown by the Greeks, the pressure exercised by Turkey's determined stand, and Great Britain's success against the fascist forces in Egypt, may have been responsible for the continuation of Bulgaria's official neutrality. It was rumoured that Germany demanded the passage of German troops through Bulgaria against Greece and Turkey, but that the demand was refused in 1940.

In view of the strained internal situation, King Boris dissolved the parliament and new elections were held in Jan. 1940. Hopes that the new parliament would reflect less the oppositional attitude of the people were not realized. The government, of course, received the majority of the votes, but this majority was much smaller than expected. Under these circumstances, the Prime Minister, George Kiusseivanoff, who had ruled the country as the king's confidant for four years, resigned and the Minister of Education, Bogdan Philoff, an archaeologist and scholar of renown, formed the new government with Ivan Popoff as foreign minister and Ivan Bagrianoff, a declared friend of fascism, as minister of agriculture. The new parliament was opened on Feb. 24. The only important piece of legislation passed during the spring was a bill re-introducing compulsory military service for all men between 17 and 65, thus abolishing the disarmament clause of the peace treaty of Neuilly.

The re-acquisition of the Southern Dobruja which Bulgaria had ceded to Rumania in the peace treaty of Bucharest in 1913 at the end of the second Balkan War was greeted by all Bulgarians with enthusiasm. The weakening of Rumania under heavy pressure from Germany, the Soviet Union and Hungary, gave Bulgaria the opportunity to re-annex the land without any actual warfare. Southern Dobruja, with a predominantly Bulgarian population, represents a relatively fertile land between the lower Danube and the Black sea; the population includes strong Turkish and Rumanian minorities, the latter to be exchanged for the Bulgarian minority remaining in the Northern Dobruja region. The important Bulgarian port of Varna on the Black sea receives its natural hinterland by the Bulgarization of the Southern Dobruja, which was occupied on Sept. 20 by Bulgarian troops. Bulgaria voiced her intention of entering into friendly relations with Rumania after the fulfillment of her territorial claims, but her relations with Greece remain strained. Relations with Turkey and with Yugoslavia seemed to be improving at the end of 1940, although a certain distrust on both sides continued. On Dec. 29 the parliament expressed support of the government's foreign policy which the foreign minister defined as aimed at keeping the country out of war while defending the nation's "vital interests." In view of the growing sympathies for Russia as against Germany with the Bulgarian peasant masses, the majority party decided to stage an intensive campaign of speeches by cabinet ministers all over the country to explain its foreign policy to the people. (H. Ko.)

Bunau-Varilla, Philippe (1859–1940), French engineer, was born in Paris, July 25. He was graduated from the École Polytechnique and was at once employed by the government as an engineer of bridges and roads. In 1884 Count de Lesseps hired him as an assistant engineer in the Panama Canal company and made him chief engineer a year later. When the French company stopped work in 1889 Bunau-Varilla devoted himself to interesting the United States in the completion of the canal, and he was active in the negotiations which led to the sale of the French rights to the United States for $40,000,000. He was later interested in railroads in Africa and Spain. During the World War of 1914–18 he served as a major of engineers in the French army. He died in Paris, May 18.

Bundy, Omar (1861–1940), U.S. major general, was born in New Castle, Ind., June 17, and was graduated from the United States Military academy in 1883. He continued his studies at the Infantry and Cavalry school and the War college. He began active service with the 2nd infantry regiment and fought in the Indian Wars, the Spanish-American War and in the Philippines. He was cited for gallantry in action both in Cuba and in the Philippines. When the United States entered the World War in 1917 he was in command of a regiment on the Mexican border. He sailed for France in June 1917, in command of the 1st brigade of the 1st division, was transferred to the command of the 2nd division and was active in stopping the German advance at the battle of Château-Thierry. General Pershing sent him to the United States in Oct. 1918 to supervise the training of American troops at Camp Lee, Va. Before he was sent home he had been promoted to the command of the 6th army corps. He died in Washington, Jan. 21.

Bureau of Standards, National: *see* STANDARDS, NATIONAL BUREAU OF.

Burma. A British province lying on the eastern side of the Bay of Bengal, between India and Siam. Area 261,610 sq.mi.; pop. (est. 1940) 16,000,000. Chief towns: Rangoon (cap. 460,000), Mandalay (150,000), Moulmein (70,000). Governor: the Rt. Hon. Sir A. D. Cochrane; prime minister: the Hon. U. Saw; languages: Burmese and English; religion: Buddhist (85%).

History.—For the greater part of 1940, Burma enjoyed a period of relative stability. After the defeat of U. Pu's government in September, U. Saw led the new government. Burma gave the required year's notice for the termination of the Indo-Burman (Trade Regulation) Order in Council of 1937. It was expected that a new trade agreement would be negotiated by the two countries to take effect from April 1, 1941. The war necessitated the introduction of price control in order to prevent profiteering and an undue rise in the cost of living.

In order to conserve currency, imports were regulated under a system of licences. Export restrictions were imposed to prevent supplies from reaching enemy countries directly or indirectly. The British government made arrangements to buy up Burma's supplies of essential raw materials including minerals. Priority of shipping space was given to other essential products like teak, rice and beans. As more than half of Burma's import and export trade is with India and most of the rest is with other British empire countries, Burma's economic structure was not unduly disturbed in consequence of the war. Better prices were obtained for some of her export products and prices were stable for others so that there was some economic benefit.

Through the appointment of joint secretaries, the defence and the commerce departments worked in close co-operation to

THE BURMA ROAD, main route for war supplies to China, was closed by the British July 18, 1940, in an agreement with Japan, but was reopened three months later

facilitate war work. The governor's appointment of the Hon. U. Maung Gyee as the first Burman counsellor in addition to his two British counsellors marked a further step in constitutional progress. During the rainy season, the much discussed Burma-China road was closed but was reopened in October.

Education.—In 1939: total number of schools 27,059; scholars 824,432; primary schools 5,432; scholars 363,089; middle 1,015; scholars 138,681; high 376; scholars 88,783; special 1,214; scholars 18,292; unrecognized institutions 19,020; scholars 213,-294; university, Rangoon, 2,210 students; arts college, Mandalay, 83 students.

Finance.—Revenue (est. 1940–41) Rs.16,03,06,000; expenditure (est. 1940–41) Rs. 16,46,60,000; public debt (net debt on March 31, 1939) Rs. 24,13,31,000; exchange rate: rupee (Rs. 1) =1*s.* 6*d.*

Trade and Communications.—Overseas trade (merchandise) (April–March 1939–40): imports Rs. 25,16,00,000; exports Rs. 54,05,00,000; re-exports Rs. 98,00,000. Communications 1939: roads, suitable for motor traffic, all-weather 6,263mi.; seasonal 6,280mi.; railways, open to traffic 2,060mi.; inland waterways (approx.) 1,300 miles.

Agriculture, Manufactures, Mineral Production.—Production (est. 1939–40): rice 5,175.930 long tons; petroleum (crude) (1938) 263,823,265gal.; ground nuts 190,000 long tons; sesamum 52,000 long tons of seed; tobacco (1939) 90,468,000lb.; silver (1938) 5,920,000 troy ounces. (For further statistics *see* COTTON; LEAD; MINERAL AND METAL PRICES AND PRODUCTION; TIN; TUNGSTEN. *See* also CHINESE-JAPANESE WAR.) (H. L.)

Buses, Motor: *see* ELECTRIC TRANSPORTATION; MOTOR TRANSPORTATION; MOTOR VEHICLES.

Butler, Smedley Darlington (1881–1940), U.S. marine corps officer, was born in West Chester, Pa., July 30. He was educated at the Haverford school. When the war with Spain began in 1898 he obtained appointment as a lieutenant of marines through the influence of his father, a member of congress. He was promoted through various grades until he reached the rank of major general in 1929. He retired Oct. 1, 1931. He had a record for distinguished service in various parts of the world and received two congressional medals of honour. In 1924 he obtained a leave of absence and served as director of public safety in Philadelphia for not quite two years. He died in the Naval hospital in Philadelphia, June 21.

Butte, George Charles (1877–1940), professor of law in the University of Texas, was born in San Francisco, Calif., May 9. He was graduated from the University of Texas in 1903 and after another year of study he began to practise in Muskogee, Okla. In 1911 he went to Europe and studied at the universities of Berlin and Heidelberg and at the École de Droit in Paris. On his return to the U.S. in 1914 he was engaged as professor of law at Texas university. During the last year of the World War of 1914–18 he was chief of the foreign intelligence department of the United States general staff. He was defeated as the Republican candidate for governor of Texas in 1924 and was appointed in 1925 as attorney-general of Puerto Rico, serving until 1928. He then became successively an assistant to the United States attorney-general, vice-governor of the Philippines, and associate justice of the supreme court of the islands. He died in Mexico City, Jan. 18.

Butter. Output of creamery butter in the U.S. in 1940 was at a rate slightly higher than that of 1938 when 1,786,000,-000lb. were produced, a new high record at that time. For the first ten months of 1940 creamery butter output in the U.S. was 1,567,790,000lb. compared to 1,533,705,000lb. in the same period in 1939 and about 1% higher than the first ten months of the record year 1938. Experts in the butter trade estimated that full-year production in 1940 exceeded that of 1938 by approximately 1%, establishing a new record. Production in 1939 was reported by the U.S. department of agriculture as 1,761,775,000lb. June 1940 established a new high in monthly production of creamery butter, 203,800,000lb. as against 202,540,000lb. in 1938 and 199,-560,000lb. in 1939. June is the month of heaviest butter production. Market conditions for butter in 1940 were entirely different from those in the preceding peak year, 1938. In 1940 increased employment and industrial activity provided a consumer demand and buying power that supported the market at substantially higher prices. Comparatively little butter was distributed for relief purposes. In 1938 the Dairy Products Marketing association borrowed approximately $33,000,000 from the federal government and bought about 114,000,000lb. of butter, virtually all of which was distributed through relief channels. In the first half of 1940 the Federal Surplus Commodities corporation bought comparatively small amounts of butter in supporting the market; about 1,500,000lb. in March, 5,000,000lb. in April, 480,000lb. in May and subsequently inconsequential scattered purchases of a few hundred tubs. The Dairy Products Marketing association, which is a marketing organization for dairy co-operatives, was authorized by the department of agriculture to buy up to 25,000,-

000lb. of butter in the period between May 1, 1940 and April 30, 1941, but in 1940 the DPMA took practically no action as the steady consumer demand maintained prices, and butter consumption reached a new high record. On Nov. 1, 1940, butter in cold storage amounted to 104,673,000lb. compared to 128,111,000lb. on the same date in 1939, while stocks in the hands of the Federal Surplus Marketing administration (successor to the Surplus Commodities corporation) and state relief agencies were only 73,000lb., an inconsequential amount. U.S. butter exports the first nine months in 1940 were 2,113,895lb. and imports 910,906lb. compared to 1,539,193lb. exports and 781,417 imports in the same period in 1939. In the futures market during 1940 butter prices advanced steadily, November butter advancing from 28.80 cents per lb. in June to 33.50 cents Nov. 30 on the Chicago Mercantile exchange. (*See* also MILK; DAIRYING.) (S. O. R.)

Butyl Rubber: *see* CHEMISTRY; RUBBER AND RUBBER MANUFACTURE.

Byrd Antarctic Expedition Number 3: *see* EXPLORATION AND DISCOVERY.

Byrne, Edward J. (1872–1940), Catholic archbishop of Dublin, was born in that city, was educated at Belvedere college and the Irish college in Rome and was ordained a priest in 1895. He served as vice-rector of the Irish college from 1901 to 1904, when he was made curate of the procathedral in Dublin, holding that post until 1920. A year later he was made archbishop and primate of Ireland. In 1932 he was made a Knight of the Grand Cross of the Sovereign Order of Malta. He died in Dublin, Feb. 9.

Cabinet Members. The following members of President Roosevelt's cabinet held office on Jan. 1, 1941:

Post	*Name*	*State*
Secretary of State	Cordell Hull	Tennessee
Secretary of the Treasury	Henry Morgenthau, Jr.	New York
Secretary of War	Henry L. Stimson	New York
Attorney-General	Robert H. Jackson	New York
Postmaster General	Frank C. Walker	Pennsylvania
Secretary of the Navy	Frank Knox	Illinois
Secretary of the Interior	Harold L. Ickes	Illinois
Secretary of Agriculture	Claude R. Wickard	Indiana
Secretary of Commerce	Jesse H. Jones	Texas
Secretary of Labor	Frances Perkins	New York

Great Britain.—Immediately on the declaration of war in Sept. 1939 a war cabinet was constituted; at the close of 1940 the war cabinet was composed as follows:

Post	*Name*	*Party*
Prime Minister and First Lord of the Treasury	Winston Churchill	Conservative
Lord Privy Seal	C. R. Attlee	Labour
Lord President of the Council	Sir John Anderson	Conservative
Secretary of State for Foreign Affairs	Anthony Eden	Conservative
Minister without Portfolio	Arthur Greenwood	Labour
Minister for Aircraft Production	Lord Beaverbrook	Conservative
Chancellor of the Exchequer	Sir Kingsley Wood	Conservative
Minister of Labour and National Service	Ernest Bevin	Labour

For other ministers and members of the government *see* GOVERNMENT DEPARTMENTS AND BUREAUS.

Cadmium. World production of cadmium in 1940 approximated 4,500 metric tons, of which the United States supplied about half, followed by Mexico, Germany, Canada, Belgium, Australia and several minor producers. The outbreak of war in Europe drove the price of stick cadmium from 50 cents per pound in Aug. 1939 to 80 cents in Jan. 1940, at which point it stood for the remainder of the year; platers' anodes were consistently 5 cents higher. Consumption of cadmium in the United States rose to a new high level in 1939, at 5,922,000lb., more than double that of 1938, and sales exceeded production by 14%. (G. A. Ro.)

Caldecott Medal: *see* AMERICAN LIBRARY ASSOCIATION; CHILDREN'S BOOKS.

Calendar of Events, 1940: *see* pages 1–16.

California, Pacific coast state of the United States, and thirty-first state to enter the Union (Sept. 9, 1850), is popularly known as the "Golden State." The area is 155,652 sq.mi., and the population (U.S. census, 1940) 6,907,387, an increase of 1,230,136 (more than any other state) over the 1930 figure (5,677,251). The gain for the decade was 21.7%, as compared with 65.7% for 1920–30, and entitled the state to increase its congressional delegation from 20 to 23. Rural population gained 32.2% and urban only 17.8%, reversing the trend during 1920–30, when the increases were 78.8% for urban and 37.9% for rural. Total city population was 4,902,265 (71%) and rural 2,005,122. Chief cities (with increase over 1930 in parentheses) were: Los Angeles, 1,504,277 (21.5%); San Francisco, 634,536 (less than 1%); Oakland 302,163 (6.4%); San Diego, 203,341 (37.4%); Long Beach, 164,271 (15.7%); Sacramento (the capital), 105,958 (13%); Berkeley, 85,547 (4.2%); Glendale, 82,582 (31.6%); Pasadena, 81,864 (7.6%). Fifty other cities exceeded 10,000. In 1930 there were 97,456 Japanese, 81,048 Negroes, 37,361 Chinese and 1,073,946 foreign born.

History.—The year 1940 was marked by continued political dissension between the legislature and Governor Culbert L. Olson (liberal Dem.), and by widespread economic improvement under the stimulus of the national defence program. The legislature held its regular biennial meeting in 1939, but convened for five special sessions in 1940, largely to consider relief needs, for which it had made inadequate provision in the 1939–41 budget. Conservative Democrats in the assembly joined with Republicans to form an "economy bloc," which elected Gordon Garland, anti-Olson Democrat, as speaker and dominated capital politics throughout the year. Except for relief appropriations, the legislature transacted little important business. A bill excluding Communist party candidates from the state ballot was adopted almost unanimously and endorsed by Governor Olson, but on most other matters the governor and legislature sharply disagreed.

Three state-wide elections were held in 1940. The third-term issue split Democratic ranks in the presidential primaries, with the Olson-sponsored Roosevelt delegation winning decisively over three other groups, including one headed by Lieutenant Governor Ellis E. Patterson, between whom and the governor there was a spirited rivalry most of the year. In the November general elections the state cast a record vote of 3,300,410, 81% of its 4,052,395 registration. Complete statistics for the California presidential election were as follows: Roosevelt, 1,877,618; Willkie, 1,351,419; Thomas, 16,506; Browder, 13,586; Babson, 9,400. The figures for the U.S. senatorial election were: Hiram Johnson, 2,238,899; Fred Dyster (Prohibition), 366,044; Anita Whitney (Communist), 97,478; John Anson Ford (write-in), 7,415; scattering, 4,024. Eleven Democrats and nine Republicans were elected to congress, and the bi-partisan "economy bloc" confirmed its control of the state legislature, despite the governor's active campaign against some of its members. The outstanding event in municipal elections was the defeat of Buron Fitts, district attorney in Los Angeles for 12 years, by John F. Dockweiler, former Democratic congressman.

Relations between capital and labour were generally harmonious with shipping and agriculture remaining relatively free from the violent disturbances of previous years. Public works aided

greatly in improving labour's position. Nearly $30,000,000 in federal funds was allocated for improvement of facilities at the Mare island naval yard and for construction of an air base at Alameda and a naval supply depot at Oakland, while considerable sums were likewise allotted for other defence bases throughout the state. Employment reached a peak of 5,000 men on the $228,000,000 central valley reclamation and water-power project, which embraces one-third of the state's area and two-thirds of its agricultural lands; by June 1940, $43,000,000 had been expended on this undertaking, and $30,000,000 more was available for the fiscal year ending June 1941.

Education.—The University of California continued to be ranked with Harvard and Columbia as one of the country's leading universities. With a physical plant valued at over $55,000,000, gross assets exceeding $90,000,000, and an operating budget of $13,500,000 for 1940–41 (63% received from the state), the university led the nation in full-time enrolment (28,851 in the fall semester 1940). The well-developed public school system, buttressing the university, was allotted nearly $77,000,000 by the state for 1939–41.

Charities and Correction.—For the 1939–41 biennium the state appropriated some $75,000,000 for unemployment relief, for which the need mounted steadily until early 1940, largely due to the influx of migratory workers, of whom from 300,000 to 400,000 entered the state during 1933–40. Improved business conditions in the middle and latter part of 1940 sharply reduced relief rolls, with the state relief administration case-load dropping from 111,306 in February to 37,907 in November, and WPA cases from 90,911 to 78,592. During the fiscal year ending June 30, 1940, nearly $43,000,000 in state and federal funds was disbursed to the blind, the aged, and needy children, while the counties paid an additional $57,000,000. California led the nation in payments to the aged, with an average of $37.90 monthly per recipient, as compared with the national average of $20.09. In October, 148,175 aged, 37,554 children and 7,318 blind received categorical aids. State benevolent, correctional and penal institutions were allotted $25,000,000 for 1939–41 (nearly 25% of the sum provided for government operations); inmates averaged 37,963, a 41% increase over 1930.

Finance and Banking.—The budget for the 1939–41 biennium was $554,415,806 (exclusive of federal subventions), highest in the state's history. On June 30, 1940 the cumulative general fund cash deficiency reached a record high of $82,110,559, including a $44,746,926 carry-over from previous biennia. Thereafter the deficit rapidly diminished, as business expansion and defence spending increased revenues and combined with military conscription to reduce the need for unemployment relief. On Nov. 30 the deficit was $68,600,538 (still $12,962,000 more than in Nov. 1939) and was expected to decline to $40,000,000 by June 1941. Tax receipts for the fiscal year ending June 30 were $328,725,411 (about $18,000,000 over 1938–39 and $81,000,000 over 1937–38). State bonded debt for the fiscal year was $172,000,000, and total bonds outstanding were $933,000,000. On June 29 there were 227 banks (128 state, 99 national), with loans of $1,862,112,000 (compared with $1,789,889,000 in 1939), investments of $1,806,303,000 (compared with $1,733,241,000 in 1939), and deposits of $4,110,088,000 (compared with $3,984,342,000 in 1939).

Agriculture, Manufactures.—Substantial gains were made in nearly all branches of economy during 1940, continuing a trend begun in late 1939. The total production value in basic industries rose 14·3% to approximately $2,340,000,000, as compared with $2,047,000,000 for 1939; $1,927,000,000 for 1938; and $2,424,000,000 for the record year of 1929. Manufacturing (value added) contributed 49%, agriculture 28%, mining 19%, lumbering 3% and fishing 1%. (In 1900 agriculture accounted for 47·1% and manufacturing 32·7%; manufacturing became the leading industry in 1919.) Gross farm income was estimated at $657,000,000, an 11% gain over 1939. Gold production, in which the state maintained its top rank, declined for the first time since 1930; the yield was 1,408,700 fine ounces (valued at $49,304,500), 2% less than in 1939. The European war spurred copper, lead and zinc mining, and, although adversely affecting foreign trade, caused a general industrial expansion through the awarding in this state of over $1,000,000,000 in federal defence contracts. Spectacular progress was made in San Francisco shipbuilding, in which employment increased 261% and pay rolls 349% over 1939, and in the southern California aircraft industry, in which employment rose 101% and pay rolls 124%. In December, total industrial employment and pay rolls were 23% and 27% higher, respectively, than at the end of 1939. Imports were $153,015,645 for the first ten months (compared with $107,275,607 in the same period of 1939); exports aggregated $210,260,211 (compared with $230,970,639 in 1939).

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California, University of. During the year 1940 the University of California was honoured by the award of the 1939 Nobel prize in physics to a member of its staff, Dr. Ernest Orlando Lawrence. The award, as far as known the first to be received by a member of the faculty of a state university, was made at a ceremony on Feb. 29, 1940, with the Swedish consul in San Francisco representing the Nobel prize committee. Dr. Lawrence's work, involving the development of the "cyclotron" and research on nuclear physics, was further recognized by gifts totalling $1,250,000 from the Rockefeller Foundation and other agencies, to go toward the cost of constructing a larger cyclotron which will produce energies of the order of 100,000,000 electron-volts. A site for the new instrument was chosen on the crest of a hill overlooking the Berkeley campus and construction was started in the fall of 1940.

Two additional members of the university faculty, Dr. Karl F. Meyer and Dr. Wendell Latimer, were elected to the National Academy of Sciences, bringing the university's representation in the academy to 23 members.

Among various changes instituted at the university may be cited the following: extension of the program of student guidance and counselling; liberalizing of entrance requirements and stiffening of requirements for continued residence; the establishing of a graduate department of social welfare; establishing of a department of journalism; the creation on the Los Angeles campus of a college of applied arts; the establishing of a program of research and public service in the field of ornamental horticulture under the college of agriculture.

Enrolment on the seven campuses making up the university increased from 27,551 in 1939 to 28,851 in 1940. Summer sessions enrolled an additional 8,153. Instructors, curators and research workers totalled 2,388. An additional 744 instructors and administrators were engaged by the extension division. Gifts for the year totalled $1,321,944.86. The number of volumes in the libraries was 1,700,000. (R. G. S.)

Callahan, Patrick Henry (1866–1940), U.S. industrialist, was born in Cleveland, Ohio, Oct. 15. He received his education in St. John's High school and the Spencerian Business college in Cleveland. He began his business career with the Glidden Varnish company of that city, remaining with it until 1892 when he became connected with the Louisville Varnish company, rising to its presidency. He intro-

duced a system of profit-sharing for his employees and was active in various societies favouring international peace, the prohibition of the sale of intoxicants, the regulation of child labour, and religious toleration. Pope Pius XI made him a Knight of St. Gregory. He served as a director of the Reconstruction Finance corporation and the National Labor Relations board. He died in Louisville, Feb. 4.

Camacho, Manuel Avila: *see* AVILA CAMACHO, MANUEL.
Cambodia: *see* FRENCH COLONIAL EMPIRE.

Cambridge, University of. In the Michaelmas term 1939 there were 4,353 men students and 465 women *in statu pupillari,* as compared with 5,491 and 513 in the previous year. In the Lent term 1940 the number of men had dropped to 4,218. There were also 1,649 evacuated students from London colleges and medical schools The number of masters of arts and seniors was 1,374 men, 152 women and 235 evacuated staff. The council decided that four terms would be allowed towards degrees to students on war service. Under the university emergency provision act of 1939 power was granted to suspend vacant offices, scholarships, etc. The university lost by death Professor Whitney (ecclesiastical history), Professor Sir W. J. Pope (chemistry), Dr. A. C. Haddon (the pioneer of scientific anthropology and leader of the Cambridge expedition to Torres straits) and Sir J. Withers (the senior burgess). During the year three heads of colleges died: Peterhouse, H. W. V. Temperley (professor of modern history); Trinity, Sir J. J. Thomson (the pioneer of atomic physics); Jesus, A. Gray (historian of the town). The windows of King's college chapel were removed to a place of safety. (C. Fo.)

Cameroons: *see* BRITISH WEST AFRICA; FRENCH COLONIAL EMPIRE.

Campbell, Beatrice Stella (MRS. PATRICK CAMPBELL) (1865–1940), English actress, was born in London, Feb. 9, the daughter of John Tanner. She received a musical education and in 1884 married Captain Patrick Campbell, who went to South Africa two years later and was killed in the Boer War. She played with an amateur dramatic company in London in 1886 and made her professional debut on the stage in Liverpool in 1888. She won sufficient success to justify casting her for the leading part in *The Second Mrs. Tanqueray* in 1893. Her performance was so brilliant that she was in constant demand thereafter, playing with Beerbohm Tree, John Hare and Forbes-Robertson, appearing as Juliet to Forbes-Robertson's Romeo. She made her first appearance in the United States in 1901. In 1904 she acted with Sarah Bernhardt in *Pelleas and Melisande.* At the height of her career Kipling referred to her in a poem as "a rag, a bone and a hank of hair." She published her memoirs in 1922, including letters to her from George Bernard Shaw which created a sensation. At the age of 65 she made her debut as a motion picture actress. Her last appearance on the stage was in 1938. She died in Pau, France, April 9.

Camp Fire Girls. The Camp Fire Girls' program of recreational, educational and character developing activities for girls (formulated in 1910–11) was re-examined during 1940 in relation to world conditions and the preparation of the United States for total defence. Believing that the training of youth is as important to our country's welfare as the drilling of soldiers and the manufacture of tanks and aeroplanes, the following resolution was passed by the national board of directors at their meeting in May 1940:

We, the National Board of Directors of the Camp Fire Girls, do therefore resolve:

To stress the American ideals inherent in the Camp Fire Girls' program—to help girls understand the privileges and responsibilities of Democracy—to give them actual experience in the Democratic way;

To keep alive those things that are civilized in our society—to stimulate, through appreciation and participation, creative art and creative thinking, believing them to be life-renewing and continuing through and beyond the present destruction;

To give generously through the American Red Cross and other agencies, realizing always that while we do what we can to assuage the suffering of the present, the task and privilege of youth is to prevent suffering and injustice in the future;

To hold to the faith that is ours in man and God.

This was further supplemented at the meeting of the national council held in New York in September by a discussion under the leadership of Mary Beard, historian and economist, when it was agreed to avoid war hysteria and to concentrate on training in democracy, health, creative activities, service and consumer education (wise buying and use of food, clothing and home furnishings).

Camp Fire Girls in Great Britain, Holland and China have been highly commended for the service they have given particularly in the care of refugees and war sufferers.

At the meeting of the national council the following officers were elected: president, Mrs. Elbert Williams; treasurer, Ward Johnson; secretary and national executive, Lester F. Scott. Her Highness Princess Marie Louise is patroness of the British Camp Fire Girls and Lady (Walter) Hearn is president. (C. F. Lo.)

Canada. Canada, self-governing British dominion of North America; capital, Ottawa; governor general, the Earl of Athlone; prime minister, the Rt. Hon. William Lyon Mackenzie King; area, 3,729,665 sq.mi.; pop. (census of 1931) 10,376,786, estimated (Jan. 1, 1941) 11,484,000.

History.—Almost at the opening of 1940 the tragic death of Lord Tweedsmuir (previously the distinguished scholar and author, John Buchan) left vacant the office of governor general. On the advice of the Canadian ministry, the crown appointed the Earl of Athlone, a cousin of King George, a veteran soldier and formerly governor general of the Union of South Africa (1923–31). Lord Athlone arrived in Canada (with his wife, Princess Alice) in June and was installed in office on June 21.

Government and Politics.—The outstanding political event of 1940 was the dominion general election of March 26. The Liberal

OTTAWA AIR STATION during an inspection in the spring of 1940 by Canadian Air Marshal Bishop

party, in power under Mr. King since Oct. 23, 1935, was returned with an increased majority. The election turned almost solely on war issues. The National Conservative party, led by Dr. R. J. Manion, attacked the government by ascribing lethargy and ineffectiveness to their war effort. On the other hand, the Conservatives were handicapped by the memory of the overseas conscription of their government in the war of 1914–18, as compared with the Liberal policy of conscription for home defence only.

A number of cabinet changes were made during the year. On April 11, C. D. Howe was named minister of munitions and supply. After the general election, James Angus MacKinnon, previously a minister without portfolio, was made minister of trade and commerce, and Pierre François Casgrain was made secretary of state. After presenting the budget, the minister of finance, Col. James Ralston, assumed in the new cabinet the portfolio of national defence, left vacant by the untimely death of Norman Rogers. J. L. Ilsley became the new minister of finance. The portfolio of the minister of national defence was lightened by the adjunct appointments of a minister of defence for air, C. G. Power, and a minister of naval defence, Angus L. Macdonald.

In provincial politics a leading event was the general election held in Alberta on March 21. The social credit government of William Aberhart, which had come into power in Sept. 1935, was again re-elected, but with a majority reduced to 36 of the 57 seats. In New Brunswick, the vacancy caused by the resignation of the premier, A. A. Dysart, was filled by J. K. McKee, elected by acclamation. In Quebec, an act was passed in April granting the provincial franchise to women and permitting their candidacy in provincial elections.

A principal event in municipal history was the adoption of the new form of government of the city of Montreal at the elections of Dec. 9. Adhémar Reynault was elected mayor; Camillien Houde interned and disqualified. The new city council consisted of 99 unpaid members; 33 appointed by civic, commercial and educational bodies; 66 by a vote of the property holders, six from each of 11 districts, of whom three must be property owners. Very little interest was taken in the election. Little more than a quarter of the voters went to the polls. One property seat went begging.

Of changes in the diplomatic service may be mentioned the appointment of J. H. R. Cromwell as United States minister at Ottawa and his resignation in May, due to his candidacy for the United States senate, and the subsequent appointment of J. P. Moffat. Dr. Henry Laureys of Montreal was appointed high commissioner to South Africa.

Parliament met on May 16. At a Conservative caucus, Dr. Manion had withdrawn from his leadership and R. B. Hanson took his place as leader of the opposition in the new parliament. The most important pieces of legislation adopted were the National Registration act and the National Resources Mobilization act. The former of these called for compulsory registration of all Canadian residents 16 years of age or over, Aug. 19, 20, 21, 1940.

For a declared refusal to obey the act after it was passed and for publicly urging others to refuse, Camillien Houde, the mayor of Montreal, was sent to a concentration camp under authority of the War Measures act. A later order disqualified all persons interned from being candidates in any election while in internment. The National Resources Mobilization act authorized the government to conscript all human and material resources for the defence of Canada. It instituted compulsory training, for one month, for all able-bodied men between 21 and 45 years of age as called up.

Public Finance.—The second war budget of the dominion was presented by the minister of finance on June 24, 1940, deali with the fiscal year then running (March 31, 1940–March 3 1941). Provisions had to be made for an estimated expenditu of $448,000,000, as apart from the war expenditure, and for war expenditure of $700,000,000 already authorized, and for additional war expenditure of $150,000,000 to $200,000,000. meet this there was available anticipated tax revenue from pre ent taxes of about $650,000,000, and from new taxes of abo $150,000,000. This would leave a shortage of anticipated incon to cover anticipated expenditure of nearly $700,000,000, whi must be met by loans.

The first dominion war loan of $200,000,000 (3¼% bonds du 1952) was accordingly opened Jan. 15, 1940, and was heavi oversubscribed. The second dominion war loan was offered o Sept. 6 ($300,000,000, 3% bonds due 1952) and was fully su scribed by Sept. 21. Both these loans were raised entirely Canada, outside subscription being illegal. The returns showe that the great bulk of the money came from actual savings an not by advance borrowing on the part of subscribers. Stoc market returns as tabulated in December showed the credit o the dominion as on a 3½% basis.

A supplementary budget (so-called "baby budget") wa brought down by Mr. Ilsley on Dec. 2. War purchases ha greatly strained in 1940 the exchange relations of Canada wit the United States. The adverse balance against Canada wa estimated at $280,000,000, or double that of the previous yea To meet the situation, the baby budget aimed to increase com mand of dollar funds for war purchases in the United States b checking luxury imports. It placed an embargo on the impo of U.S. automobiles, oysters, tobacco, silks and certain fictio magazines. It was estimated thus to conserve $50,000,000 o exchange. It imposed new excise taxes (20% to 25%) to chec Canadian production of luxuries. To aid the absorption of ste ling exchange, it set free from customs taxes British cottons, silk soft coal, marmalade, furniture, etc.

Rowell-Sirois Commission and Dominion-Provincial Relation —The second session of parliament was held from Nov. 7 t Dec. 6, with adjournment until Feb. 17, 1941. The chief featur of the session was the announcement that the government ap proved in general terms of the report of the Rowell-Sirois com mission and would summon a conference with the province thereon in Jan. 1941. Later advices indicated the acceptance o the invitation by all the provinces.

The appointment of the Rowell-Sirois commission had arise out of the inadequacy of the powers of the dominion governmen to meet the newer conditions of industry and the need for socia legislation. The unsuccessful attempt of the dominion to ente the field in 1935 led to the appointment of this ambulatory com mission which spent two and a half years in holding hearings an receiving provincial and other reports. The commission recom mended a redistribution of tax power, confining to dominio authority all income taxes, inheritance taxes and special taxes o corporations (other than those that would fall on individuals) In return, it proposed that the dominion should assume all provin cial outstanding debt, with supervision by national finance counci of future loans; take over unemployment relief and old age pen sions; make special social and educational grants to meet need of certain provinces, and make loans in aid of primary industries The constitution of Canada expressed in imperial statute (B.N.A. act of 1867 and amendments) cannot be amended excep by imperial statute. But the Westminster statute of 1931 denie the right of imperial legislation over a dominion. The system is therefore, a riddle of the sphinx: recourse is, therefore, had to a formal (British) amending act passed on request from Canada Without waiting for the proposed conference on the entire sub-

HIS SMALL CANADIAN BOY said a last good-bye to his father at New Westminster, B.C., in Oct. 1940 as a column of Canadian troops left for an unknown destination in Britain or some part of the British empire

ect involved, the government, with the consent of all the provinces and with the validation of an imperial statute, adopted a Federal Unemployment Insurance act. It is modelled on the British statute of 1911, with contributions from workers, employers and the dominion government hired men in primary industries (farming, lumbering, fishing), and all wage earners of over $2,000 a year.

Relations of Canada with the United States.—The chief feature of interest during 1940 was the increasing measure of aid, "short of war," extended by the United States to the British cause, much of it operative through Canada. The question of the St. Lawrence seaway was much agitated, but nothing final arranged in 1940 as to any new measures. The province of Ontario authorized and announced the diversion of water from the James Bay slope.

Industries.—Every branch of Canadian industry was being accelerated in 1940 to its fullest capacity to keep in pace with the large war contracts. A statement of the prime minister showed that the Canadian government up to Nov. 4 had made war contracts involving $443,000,000, of which 87% would be spent in Canada, and had placed in Canada for the British government contracts amounting to $134,000,000.

Over and above these war contracts there have been placed capital commitments (Canadian $235,000,000; British $81,000,000) for new plant construction to meet the needs of the war. Construction contracts for industrial purposes during the first nine months of 1940 were more than four times as great as in the same period for 1939. The building trades have been further stimulated by direct military requirements for barracks, air bases, training fields, etc.

Employment.—As a consequence of this expansion of industry the situation in regard to employment entirely altered. The dominion bureau of statistics announced that towards the close of 1940 the number of persons employed in the manufacturing industries of Canada had reached an all-time record figure. Table I, taken from the October issue of the *Monthly Review* of the Bank of Nova Scotia, shows in detail employment changes in the manufacturing industries from Sept. 1, 1939 to Sept. 1, 1940.

Table I.—*Employment Changes in Canadian Manufacturing Industries from Sept. 1, 1939 to Sept. 1, 1940*
(Source: Dominion Bureau of Statistics)

Industry	% change + or − from Sept. 1st, 1939 to Sept. 1st, 1940	Indices at Sept. 1st, 1940 as percentages of Sept. 1, 1929
Shipbuilding and repairing	+324%	181.9
Agricultural implements	+ 76%	72.9
Iron and steel fabrication (misc.)	+ 51%	92.1
Land vehicles (including autos)	+ 42%	102.6
Foundry and machine shop products	+ 37%	116.4
Machinery (excepting vehicles)	+ 32%	115.6
Woollen textiles	+ 31%	184.6
Primary iron and steel	+ 29%	125.2
Chemicals and allied products	+ 29%	172.6
Non-ferrous metal products	+ 27%	152.5
Garments and personal furnishings	+ 26%	136.2
Cotton textiles	+ 23%	132.7
Electrical apparatus	+ 21%	103.8
Lumber	+ 21%	85.7
Artificial silk and silk goods	+ 19%	319.2
Pulp and paper	+ 19%	106.2
Furniture	+ 15%	79.4
Non-metallic mineral products	+ 13%	121.6
Clay, glass and stone products	+ 12%	79.8
Hosiery and knit goods	+ 12%	120.4
Paper products	+ 11%	127.9
Animal products—edible	+ 9%	144.5
Heating appliances	+ 6%	109.6
Rubber products	+ 5%	83.9
Tobacco	+ 5%	102.5
Electric light and power	+ 3%	107.0
Leather products	+ 2%	124.0
Beverages	+ 2%	126.6
Printing and publishing	+ 1%	101.9
Plant products—edible	− 2%	114.2

Agriculture.—The wheat harvest for 1940 is officially estimated at 561,104,000bu., an advance over the 1939 crop of 478,965,000bu., itself over the average, and only 5,500,000bu. less than the record crop of 1928. The problem of providing storage for this crop, plus the 1939 carryover, forced the dominion to adopt a quota system with a 70-cent guaranteed minimum price. Table II shows the quantities of wheat farmers may deliver at different points.

Table II.—*Quantities of Wheat Deliverable at Canadian Elevators under Quota System, December, 1940*

Province	Total No. of elevator points	Bushels per seeded acre				
		8	10	12	15	20
Manitoba	372	83	94	76	90	29
Saskatchewan	1,137	390	266	199	180	102
Alberta	611	182	165	132	91	41
	2,120	655	525	407	361	172
Per cent of total		30.89	24.76	19.20	17.02	8.11

The total 1940 estimate for other Canadian field crops is well

above that for 1939, being 547,432,000bu. compared with 518,-407,000bu. The livestock industry, the second most important branch of farming, received marked stimulus through the war, especially the production of bacon hogs. Cash income from the principal field and animal products in the period Jan.–June 1940 was 30% higher than for the same period the year before, and the highest since 1930.

At the outbreak of the war between Germany and Great Britain in 1939, an Agricultural Supplies board of six members was formed to establish constructive direction for agricultural production; to make available for export those commodities required by Great Britain; to conserve essential supplies to meet the production of farm products in Canada; and to assist in the marketing of surplus farm products. Other agricultural wartime boards functioning since the outbreak of the war were in 1940 the Wartime Prices and Trade board, the Bacon board, the office of wool controller and sugar administrator.

Mining.—Gold production in Canada continued to increase in volume as a measure to build up empire credit throughout the world. In the first six months of 1940 production rose from 2,489,969 to 2,572,042 fine ounces (valued at $87,551,061 and $99,023,617). At the outburst of the war the British Purchasing board came to agreements with Canadian producers of copper, lead, zinc, nickel and aluminium to turn over to Great Britain all but a very small proportion of their total output at prices, stabilized by long-term agreements, below the free market. Oil well operations were placed under government control. The output of coal and other non-metallic minerals was increased heavily to meet the rapidly expanding needs of industry. There has been, moreover, since the outbreak of the war, a persistent search for domestic sources of so-called "strategic materials." A plant was completed for the production of refined antimony, before imported largely from China. Large quantities of mercury, formerly secured from Spain and Italy, were obtained from mines in northern British Columbia, sufficient to supply not only Canada's, but a large part of Great Britain's requirements. Supplies of tungsten, manganese and other valuable minerals were found.

Trade.—Total exports in the nine months ending Oct. 1, 1940 (gold excluded) were $869,000,000, as compared with $644,000,-000 for the same period in 1939, an increase of 36%. Outstanding gains were shown in the export of wheat, wheat flour, meats, lumber, newsprint, wood pulp, primary steel, nonferrous metal and automobiles. Imports on figures for the same period rose to $768,700,000, an increase of 49% over 1939.

Tourist Trade.—All tourism across the sea vanished with the war. That from Canada to the United States, as apart from business travel, became negligible, partly owing to the restrictions of foreign exchange control. Tourists from the United States to Canada (Jan. 1–Oct. 1, 1940) were estimated at 9,800,000 persons, a decline of 2,000,000 from the same period of the previous year. The income to Canada from U.S. tourism for the whole year is estimated at $250,000,000, a decline of some $25,000,000. The decline was partly due to misapprehension about the regulations of entry and departure on both sides of the border. A conference to promote tourism was held in the autumn in Ottawa.

Education and the Arts.—Of necessity the war situation precluded any special developments in the world of art, letters and music. The sessions of the Royal Society of Canada (Ottawa) and of the various art associations were held as usual, and the work of the symphony orchestra in Toronto (Sir Ernest Macmillan, conductor), the Montreal Symphony orchestra (Douglas Clarke, conductor) and Les Confrères Symphoniques de Montreal (M. Wilfred Pelletier, directeur musical) were carried on with the same success as before. (S. LEA.)

War Finance and Industry.—The year 1940 opened for Canada as a nation at war. As a direct war effort the British com monwealth air plan adopted Dec. 1939 was speeded up. It wa officially announced from Ottawa in Jan. 1941 that by Sept. 194 there would be 81 air training schools in operation under this pla with a staff of 40,000. How Canadians will be affected by th new (federal) income tax is shown in Table III.

Table III.—*Canada's New Tax on Personal Incomes*

	Income	Old Tax	New Tax (Income plus Defence)
Single	$ 800	..	$ 19
Single	1,500	$ 18	100
Married	2,000	..	75
Single	4,000	144	525
Married	4,000	84	355
Married, two children	4,000	45.60	223
Married	20,000	3,112	6,530
Married	200,000	103,698	119,430

Exemptions: $1,000 single; $2,000 married.
Exemptions: $750 single; $1,500 married.
Exemptions: $600 single; $1,200 married.
Under the National Defence Tax 2% of the usual $400 allowance per child is d ductible—*i.e.*, $8 per child.

A necessarily unbalanced budget means borrowing. A defic can be met by loans only. The following shows how these loar were taken up.

The first loan, offered at mid-January 1940 was $200,000,000 3¼s of '52, callable in equal instalments after '48, with the go ernment reserving the right to accept applications for conversic of the maturing Canada 3s of March 1, '40, into an equal pa value of the new bonds. The loan was offered at par. The offe ing was made Jan. 15; by the 19th, when books were closed, cas subscriptions had reached a total of $321,276,000; in additio conversion subscriptions were received totalling $53,300,000. C the latter, $50,000,000 was allotted, making the total amount c the first war loan $250,000,000. On March 1 the government sol off the market an issue of $105,000,000 in five-year 2s at 99·37 to yield 2·13, proceeds of this loan being used in conne tion with the March 1 and June 1 maturities. At May 1 the go and foreign exchange holdings of the Bank of Canada, estimated $325,000,000, were transferred to the foreign exchange control boa and the dominion of Canada issued to the Bank of Canada $250,000,0 in one-year one per cents, and as the outstanding treasury bill total wa subsequently increased by instalments totalling in all $75,000,000 it wa assumed that this expansion was made to complete the transaction. T second war loan, composed of $300,000,000 in 12-year 3s, was offered mid-September at 98¾ to yield 3.125, with provision also made f holders of the matured 4½s of Sept. 1, 1940, to convert into the ne bonds. The second war loan proved slower of absorption than the firs but when the books were closed on the 21st of the month, after bein open two weeks, subscriptions had reached a total of $342,248,30 in addition to which were conversion subscriptions to an amount $24,946,200. Total accepted was $324,946,200, or some $575,000,0 for the two operations. Supplementing this financing program was t sale of war saving certificates, subscriptions to which reached a total $22,639,481 by Nov. 30, and the sale of non-interest-bearing certificate and stamps, which were purchased to the amount of $4,655,890 by No 30. The year's maturities totalled $270,013,637, made up of $115 013,637 in 3s on March 1, $80,000,000 in 1½s on June 1 and $75,00 000 in 4½s on Sept. 1. In addition, sterling issues totalling £47,462,77 ($212,158,604 with sterling at 4.47) were called for redemption, £28,162 775 in 3½s on April 17 and £19,300,000 in 4s on Oct. 1.

On Dec. 30 the finance minister announced the sale to the Canadia chartered banks of $250,000,000 of 2½-year 1½% notes at 99.695 an accrued interest, representing a yield to maturity of 1⅝%. Proceeds c the sale of the notes will be used to finance war expenditures, to provid funds for repatriation of Canadian securities from the United Kingdo and for general purposes of the government.

In Canada 1940 industry went through an unprecedented era. Canad was being turned into a vast arsenal of the empire, where war equipmen was being produced on an increasing scale, the war orders of the depa ment of munitions and supply up to the end of Nov. 1940 amounted t $872,000,000, including $692,000,000 on Canadian account and $180 000,000 on British account. In addition, capital commitments for plan extensions and construction of new plants up to the same date amounte to no less than $282,000,000.

The effects of these stimuli to the economic activities of Canada wer evident in every aspect of the national life. Official estimates indicate that the total number of wage earners in employment increased by 300,00 between Sept. 1939 and the same month of 1940; afterward 50,000 wer added. On Nov. 1, 1940, the official index number of employment reache the highest point ever recorded, at 139.2 as compared with 119.6 on Sep 1, 1939, at the outbreak of the war. In manufactures, taken as a whole five workers were employed at the later date for every four employed a the earlier. Sixty-one per cent more workers were employed in the iro and steel group of industries at the later date than at the earlier, whil

n the shipbuilding industry the increase in employment was no less than 70%. These results were achieved in spite of the placing of some 200,000 nen on active service and the conclusion may be drawn that Canada was eaching a position of "full employment."

Increasing employment resulted in great production in those manuacturing industries that were producing war supplies. Thus, comparing he first ten months of 1940 with the same period of 1939, the producion of pig iron increased 65%, the production of steel ingots 52% and he production of motor vehicles 45%, as compared with a gain of 25½% n the production of manufacturing industries as a whole. Mineral proluction was up 12½% and newsprint production 23%. Output of elecric power, needed in many of the war industries, rose 7.6% while daylight saving time was being generally continued throughout the winter n order to increase the supply of electricity available for industrial purposes. Again, the value of construction contracts awarded rose by 66% s the result of engineering work and industrial construction required by he war.

Railway Operations Improved.—Notwithstanding a low volume of wheat raffic the railways operated under greatly improved conditions in 1940, wing largely to the heavy movement of war materials, and both gross nd net earnings reflected the betterment. In the 51st week of the year, he railway traffic movement as expressed in the official carloadings index vas up from 99.4 to 101.2. In these weeks 2,772,000 cars were moved nd in the week ending Dec. 21 the index crossed the 100 line for the irst time since the recordings began in 1931.

The increasing tempo of Canadian business and the value of Transanada's service to the nation will be found in the statements of the opertions of the air line. In 1940 T.C.A. aircraft flew over 5,000,000 mi., arried nearly 1,000,000 lb. of mail, 100,000 lb. of express and 55,000 assengers. The average passenger travelled a distance of 560 mi. in pproximately 3¼ hr.

The contrast between the first and last of the year was marked. During he month of January there were carried 2,600 passengers, 45,000 lb. of nail and 7,000 lb. of express; in December approximately 6,000 passenrs, 100,000 lb. of mail and 11,000 lb. of express. In January 7,500 mi. vere flown each day; in December approximately 15,500.

In Jan. 1939 the company extended its service from Montreal to Moncton, where air connections are made for Halifax, St. John and Charlottetown. April 1940 saw the inauguration of a second daily ervice between Montreal and Vancouver. By July, London and Windsor ad joined the T.C.A. network by direct service. In August a fourth ound trip was added to the Toronto-Ottawa-Montreal service.

The mining industry, which played so important a part during the lepression years, was of supreme value under war conditions, the gold nines particularly having recovered metal to a value of more than $200,-00,000, a gain of more than 10%. Sold to the United States, this gold vas a helpful factor in preventing an adverse exchange situation from becoming as formidable as would have been the case had it been governed only by trade in commodities. Prior to the outbreak of war, Canada was buying United States products at the rate of $40,000,000 a month or hereabouts. Later, these purchases went as high as $74,000,000, whereas he increase in exports to United States markets had been only from $27,000,000 a month to approximately $40,000,000. Only to a limited xtent was the deficit offset by a surplus of trade with other dollar counries. (J. T. C.)

Canadian Literature.

The prestige of the costume novel in 1940 was further enhanced by Evelyn Eaton's *Quietly My Captain Waits,* a spirited romance of old Port Royal, and Frederick Niven's narrative of the Selkirk settlement, *Mine Inheritance.* Both reflect an increasing awareness of the proper use of historical perspective in fiction. An even more noteworthy contribution, in another field, was Ringuet's *Thirty Acres,* a penetrating study of modern Quebec life which equals Louis Hémon's masterpiece in sincerity and power.

General literature was distinguished by W. J. Lindal's *Two Ways of Life,* a brilliant presentment of contemporary political ideologies; John MacCormac's much discussed *Canada: America's Problem;* and Paul Bilkey's *Persons, Papers and Things,* the mellow autobiography of a famous Canadian journalist. J. F. C. Wright's *Slava Bohu,* a sympathetic study of the Dukhobors in western Canada, was a worthwhile contribution to sociological literature. The poetry crop was unusually meagre, but E. J. Pratt's *Brebeuf and His Brethren,* a vigorous narrative of the Jesuit missions in Huronia, is worthy of special mention. The year's most interesting publication was Watson Kirkconnell's *The Flying Bull and Other Tales,* a collection of robust ballads which are unique in Canadian letters. Robert Service, of Yukon fame, returned to the field with *Bar Room Ballads,* but the book lacks the novel appeal of earlier volumes in the sourdough tradition. The governor general's awards for 1939 went to Franklin McDowell's *The Champlain Road* (fiction), Arthur S. Bourinot's *Under the Sun* (poetry), and Laura Goodman Salverson's *Confessions of an Immigrant's Daughter* (general). (E. F. Gl.)

Canals and Inland Waterways.

The principal inland navigable waters of the United States are the Great Lakes, the New York State canal system, the Mississippi river system, the Atlantic Intracoastal waterway, the Intracoastal waterway from St. Marks river in Florida to Corpus Christi, Tex., the San Joaquin-Sacramento system in California, and the Columbia system in the northwest. The Great Lakes have natural deep water except in the connecting channels, which have been artificially deepened where necessary to accommodate a draft of 24ft.; and the Welland Ship canal joining Lakes Erie and Ontario, as improved by Canada, has a permissible draft of 23.5 feet. The 12-ft. New York State Barge canal is being deepened to 14ft. between the Hudson river and Lake Ontario at Oswego. The Atlantic Intracoastal waterway system between Trenton, N.J. and Winyah bay, S.C., was completed to 12-ft. project depth; from Winyah bay, S.C. to St. Johns river, Fla., dredging was in progress at the end of 1940 to increase the depth from 7 to 12ft.; and from St. Johns river to Key Largo, Fla., 63mi. below Miami, the project depths of 8 and 7ft. have been provided. Dredging in Cape Cod canal to secure a channel width of not less than 500ft. and a depth of 32ft. at mean low water was completed. The Chesapeake and Delaware canal was dredged to 27 feet. On the gulf coast projects were adopted to provide a protected intracoastal waterway not less than 9ft. in depth between St. Marks river, Fla. and Corpus Christi, Tex., more than 1,000mi., and this depth was in general available from Carrabelle, Fla., to Freeport Harbor, Tex. Dredging of the waterway extending southwest of Freeport was in progress. The Mississippi river has a 35-ft. depth to Baton Rouge, a 9-ft. depth from Baton Rouge to St. Louis and thence by a series of 26 locks and dams a channel of 9-ft. depth to Minneapolis, Minn. Beginning in 1940, the latter reach was in operation throughout for the first time.

Traffic on Major Canals and Inland Waterways of the U.S. for 1939

	Tons*
St. Clair Flats Canal	81,562,654
St. Marys Falls Canal	69,850,262
Mississippi River, Minneapolis to The Passes	29,506,270
Sabine-Neches Waterway	40,096,532
Houston Ship Channel	28,174,710
Ohio River	25,955,345
Monongahela River	21,870,916
Louisiana-Texas Intracoastal Waterway	8,167,640
New York Barge Canal	4,689,037
Cape Cod Canal	4,982,234
Chesapeake and Delaware Canal	3,034,807
New Orleans Navigation Canal	2,413,680

*Information as to the value of traffic for 1939 was not available.

The total traffic of United States canals and waterways in 1939 was computed after eliminating all known duplications of traffic at 329,419,983 short tons. (For statistics regarding the Panama canal *see* Panama Canal and Canal Zone. *See* also Aqueducts.) (J. L. S.)

Great Britain.—As in other spheres of engineering activity, the European war to a large extent arrested progress in canal and inland waterway development in Europe. Certainly, in the British Isles, there is little of importance to record for the year 1940. In England, the catchment boards, so far as was compatible with the national situation, carried on their programs of river improvement, but these, with some few exceptions, were mainly concerned with drainage problems and the provision of relief from liability to floods. From the point of view of navigation, the river Nene was in 1940 the subject of further ameliorative treatment and various locks were in course of reconstruction, while the bed of the river was dredged to afford greater depth in the navigable channel. An item of interest was the closing of the Cumberland arm and basin in the London area of the Grand Union

WORK on the Pinsk-Brest-Litovsk canal was rushed in 1940 to complete the third system of inland waterways by which Russian supplies are transported to Germany

Canal company, which became redundant and was no longer required.

Germany.—Germany has always pursued an energetic policy for the development of her inland waterways, and several important projects were under way, but with what amount of progress during 1940 it is not possible to say for reasons connected with the war. In one respect there was a definite set-back. The Dortmund-Ems canal, an important traffic route in north-west Germany, was the objective of repeated bombing attacks by the British royal air force, and in July the double aqueduct over the river Ems at Fuestrup, about eight miles north of Münster, was reported to have been seriously damaged, if not destroyed. The canal, which has a length of 170 mi., connects the industrial town of Dortmund with the seaport of Emden.

Hostile demonstrations of military force were particularly evident in Belgium, where numerous wrecked bridges blocked the waterways of that country. About 16 bridges were reported demolished on the canal connecting Roulers with the river Lys, 18 bridges on the Courtrai-Scheldt canal and 30 bridges along the river Lys itself. Such obstructions were, of course, only temporary, but they crippled traffic for the time.

Russia.—In Russia, equally energetic with Germany in inland waterway development, the U.S.S.R., following the completion of the White sea-Baltic and the Moscow-Volga canals, was busily engaged in the execution of other projects in her five-year plan. Among these was the Greater Volga scheme, undoubtedly an enterprise of exceptional magnitude. It is designed to intercept the Volga and its tributaries by means of 15 immense dams so as to form a series of large artificial lakes, which will serve for the creation of hydro-electric power. The Volga itself will be rendered navigable along its entire course, not only for shallow-draft river craft, but also for large sea-going vessels coming from the Baltic, sea of Azov and the White sea, through a system of canals, either already constructed or to be constructed during the next few years. Farther west, the Dnieper-Bug waterway connecting the western districts of Belorussia and the Ukraine with south Russia, was completed and brought into operation.

Work was begun on the Dnieper-Niemen waterway (315 mi. long) which will link up the river Yaselda, a tributary of the Pripet, with the Shchar, a tributary of the Niemen. Through the Niemen and the Dnieper, the new waterway will provide access from the Baltic to the Black sea. The scheme will entail the building of 30 locks and the route has been divided into 11 sections on which preparatory work is already in hand. The waterway will be available for traffic in 1941. (B. Cu.)

Canal Zone: *see* Panama Canal and Canal Zone.

Cancer. Some 15 years ago when a great deal of scientific activity was being exerted in the study of the peculiar chicken sarcomas which were discovered by Rous at the Rockefeller institute great interest was aroused by the fact that the tumour could be transplanted by a germ-free filtrate. This property was not constant; at times the tumour could not be transplanted and then it would regain that quality. It has been assumed, but not proved, that the carcinogenic agent was a virus. The phenomenon was so unusual that a vast series of experiments were made on other animal tumours and a mouse tumour known as 37S was found to be occasionally transmissible.

Of course, the question arises as to whether the filters employed were impermeable to fragments of cells and whether the tumour could not be started from fragments of cells or of nuclei or that the tumour tissue contained some chemical carcinogenic substance.

About this same time, Morris, at the Institute of Cancer Research of Columbia university, made a large series of filtration experiments using the Flexner-Jobling rat carcinoma. Many hundreds of rats were inoculated with filtrates and four developed tumours of the breast, though in that strain no such breast tumour had hitherto appeared.

Since that time a large number of non-specific carcinogenic substances have been discovered, which on injection subcutaneously into mice and rats produced tumours in small numbers. Among these are concentrated solutions of glucose and even of common salt. The synthetic hydrocarbons of the phenanthrene group are, of course, not under discussion, as they are capable of inducing tumours in almost 100% of animals when properly applied.

For some years a Russian author by the name of L. M. Shabad had been publishing papers in which he pointed out that benzene extract of liver tissue from persons with carcinoma of the stomach was capable of producing malignant growths in mice. Recently others, notably Menke (*Science*, 92:290, 1940) and Steiner (*Science*, 92:431, 1940), have confirmed these findings. Shabad has also shown (*Am. J. Cancer*, 39:463, 1940) that not only does the benzene extract of liver from patients with carcinoma produce cancer, but also similar extracts from livers of persons without cancer will produce malignant growths in mice and this has also been confirmed by Des Ligneris and also by Hieger. There has been considerable misunderstanding of the nature and importance of these discoveries.

All that these experiments mean is that the non-saponifiable residues extracted from the liver by benzene may induce the appearance of a few tumours in the highly susceptible albino mice which were used for such tests. These experiments merely add one more carcinogenic agent to the vast number which have already been published in the literature of the experimental study of cancer.

It is still too early to attempt to theorize as to whether the carcinogenic substance is derived from the food and is concentrated in the liver, or whether the normal liver contains traces of substances which under the extraction processes referred to possess a moderate carcinogenic power. Neither is it certain that the carcinogenic properties are due to a substance present in the liver or whether a body like cholesterol is so altered by the process of extraction that it becomes carcinogenic. Merely melting cholesterol will make it slightly carcinogenic.

It is doubtful that carcinogenic substances are present in malignant tumours, with the exception noted in the first and second paragraphs, for the vast number of animal experiments with ground up tumour tissue or with filtrates from ground up tumour tissue have failed in all but a minute portion of cases.

Nevertheless, the production of neoplasms, both in man and animals, by either hydrocarbons derived from tar, soot, or some of the dyes like alpha-naphthylamine, or from chemicals excreted by parasites like bilharzia in man and taenia crasicola has laid a firm foundation for the belief that certain chemical substances are capable of inducing the low-grade proliferative process which precedes the formation of animal and human cancer. (*See* also ALIMENTARY SYSTEM, DISORDERS OF; EYE, DISEASES OF; MEDICINE.)

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Candid Camera: *see* PHOTOGRAPHY, MINIATURE CAMERA.

Candy. Confectionery, largely a penny business, is the sixth most important division of the food industry in the United States. It is a penny business because the bulk of confectionery, including chocolate, is sold in penny units. Often referred to as a depression-proof industry, profits in candy making and selling have steadily decreased since 1921, considered the peak year. The decline has been due primarily to faulty and loose price structure.

According to the department of commerce, there are in the United States some 1,200 manufacturers of candy employing over 50,000 people, producing about 2,000,000,000 lb. of candy annually, with a wholesale volume of just under $300,000,000 and a retail volume of almost $600,000,000. But only 38 firms do an annual business of $1,000,000 or over, 65 firms are responsible for almost 60% of the output and about 200 firms do over 80% of the industry's tonnage. Candy is sold through some 500,000 outlets, from the corner candy store to even the shoe shine parlour. Chicago is the production centre. Boston, New York and Philadelphia follow in importance. Preliminary report for 1940 indicated a sales increase of 8% to 10% over 1939. The increase in raw materials started in 1939 because of the war, continued in 1940, with the result that candy prices were a little higher in 1940 than in 1939. However, prices were still low as compared with raw material costs. The average value per pound of candy in 1940 was a little over 16¢ as compared with 15¢ in 1939 and 14¢ in 1938. Per capita consumption in the United States was close to 17 lb., which means that the average American consumer buys about $2.70 worth of candy annually.

As a result of the European war, imports of candy in 1940 were reduced to record minimum. According to estimates, some 900,000 lb. of candy, valued at $140,000, were imported to the United States in 1940. Whereas such countries as Great Britain, Germany, France and Holland had hitherto shipped a great deal of candy to the United States, practically the only countries that exported candy to the United States in 1940 were Estonia and soviet Russia. As a result, one of the most interesting developments of the candy industry in 1940 was the production and development of "foreign" types of candy by domestic producers. Very little candy was produced in Europe and the only items still made in some of the countries, particularly Great Britain, were chocolate, and these were principally for consumption by soldiers.

Because of the war, the export market for candy shrunk to an insignificant minimum in 1940. In December, the Canadian government banned the importation of candy and chocolate from the United States as well as from other countries. The industry tried to make up for this shrinking volume by greater promotion in domestic consumption and by opening new export markets in South and Central America. (H. D. G.)

Cane Sugar: *see* SUGAR.

Canning Industry. U.S. and territorial canned food production in 1940 totalled about 334,000,000 cases, compared with 315,931,000 cases in 1939, and 234,146,000 cases in 1929. Production of canned food since 1930 has increased much faster than the population. On a per capita basis, production has increased about 45% since 1930, and, at the same time, prices of canned foods in general have declined.

Fruits and vegetables were the canned food items packed in largest quantity, amounting to about 245,000,000 cases in 1940. The next largest item was canned milk, of which 58,000,000 cases were packed. The 1940 fish and meat pack totalled about 31,000,000 cases. The canning industry during 1940 used over 10,000,000,000 tin containers, gave employment to about 375,000 persons and utilized a portion of the crops grown by 360,000

farmers. There was an improved market condition for canned foods, due to increase in employment in the U.S. and to the improved condition of business generally.

Legislation.—Developments concerning labelling of canned foods under the Food, Drug and Cosmetic act of 1938 were: the labelling provisions of the act, which were postponed by the Lea act, became fully effective on July 1, 1940; standards of identity, quality and fill of container for apricots, peaches, pears, cherries and peas, and standards of identity for about 40 unmixed vegetables became effective in 1940 in time for the new packs; hearings were held on various proposed amendments to existing standards; an amendment was disapproved which would have permitted the addition of sodium benzoate to catsup as an optional ingredient; a hearing was held to determine labelling provisions of foods represented for special dietary uses as provided for in section 403 (j); identity standards for canned fruits (peaches, pears, apricots, cherries) were brought to rehearing to determine what labelling should be required where various sweetening agents (sucrose, dextrose, corn syrup, invert syrup) may be used in preparation of syrup.

Research.—There was further technological research devoted to improvement of quality of canned foods. Studies of processing, or sterilization, were continued. Most important were the results of researches on chlorophyll preservation which have demonstrated that it is possible to retain the normal colour of green vegetables.

National Defence.—The National Defence council in 1940 called for the co-operation of the canning industry in anticipation of the subsistence problem for 1941 and subsequent years. In response, the industry took part in revision of specifications for government purchases and acted in other ways to facilitate purchase and delivery of supplies in the emergency period.

(E. J. C.)

Canton Island: *see* SOUTH SEA AND EQUATORIAL ISLANDS.

Cantu, Giuseppe (1873–1940), Italian vice-admiral, was born at Orzinuovi, Brescia, May 24, and was educated in the Royal Naval academy. He was aide-de-camp to the commander of the naval division of the far east in 1899 and 1900 and later became aide to the commander of the Royal Italian navy. He saw service in the war against Turkey (1911–12) and was in China during the Boxer rebellion. He was named a rear admiral in 1925. In 1935 he was president of the Council of the Royal Italian navy. He was retired in 1936 and in 1938 was named a senator. At the time of his death in New York city, Oct. 24, he was serving as head of the Italian commission to the World's Fair in that city.

Cape Verde Islands: *see* PORTUGUESE COLONIAL EMPIRE.

Carnegie Trusts. Carnegie Corporation of New York, established by Andrew Carnegie in 1911 and endowed with $135,000,000, expends its annual income in grants to institutions and agencies whose activities aim at the advancement and diffusion of knowledge and understanding among the people of the United States and of the British dominions and colonies.

During 1939–40, the corporation trustees appropriated a total of $4,696,485: library interests, $374,520; adult education, $218,000; fine arts and museums, $459,500; research and publication, $2,030,750; general educational purposes in schools, colleges, universities, etc., $1,613,715. The amount appropriated since 1911 totals $181,425,174.

The five other separately administered Carnegie organizations in the United States, which were founded by Mr. Carnegie f specific purposes before the establishment of the corporatio with endowments now ranging from $10,000,000 to $30,000,00 followed their established programs described regularly in th annual publications.

Carnegie Institute of Pittsburgh (1896), which comprises institute of technology, a museum of fine arts, a music hall, museum of natural history, a public library and a library scho carried out its normal programs. The annual international a exhibit at the museum again attracted wide attention.

Carnegie Institution of Washington (1902), devoted to s entific research, has expended since its organization $41,618,5 in its program of encouraging investigation, research and disco ery, and the application of knowledge to the improvement mankind, specifically by work in astronomy (Mt. Wilson observ tory), terrestrial magnetism, geophysics, animal and plant biolog and historical research (especially in Yucatan).

Carnegie Hero Fund Commission (1904), established to re ognize heroic acts performed in the United States of America, t Dominion of Canada, the Colony of Newfoundland, and the wate thereof by persons the nature of whose duties in following the regular vocations does not necessarily require them to perfor such acts, announced that the list of its beneficiary aid show a total of 3,126 recipients of medals and 327 persons now recei ing pensions. During the 1939–40 fiscal year, 41 persons receive educational awards and 36 others received pecuniary awards f specific purposes. Its awards for the year 1939 totalle $187,922.54.

Carnegie Foundation for the Advancement of Teachin (1905), established to provide retiring pensions for teachers an to advance higher education, paid $1,945,191.75 in retiring allov ances to retired college professors, or their widows, making total of $38,639,613.05 paid for such purposes since its establis ment. It has also continued, chiefly from funds provided by t corporation, its program of educational research, including suc activities as teacher-testing program, graduate examination stud and a comparative examination study.

Carnegie Endowment for International Peace (1910), estal lished to serve the purpose indicated by its name, expended $625 650 in its efforts to further friendly understanding among t nations of the world. Continued progress was made also in t study of Canadian-American relations, the findings of which a being reported in 44 volumes, published chiefly by Yale un versity, Ryerson and Oxford presses. This activity was mad possible by corporation grants to the endowment. (R. M. LE.)

Carol II (1893–), king of Rumania from 1930 to 194 was the eldest son of King Ferdinand and Quee Marie. For his earlier career, see *Encyclopædia Britannica,* vo 4, p. 904.

The tenth anniversary of Carol's reign on June 8, 1940, wa celebrated with foreboding for the future. Disaster in fact soo overtook both the king and his country. Within three month Carol was forced to yield Bessarabia and northern Bukovina t Russia, southern Dobruja to Bulgaria and about half of Transyl vania to Hungary. Then, in a last desperate effort to save hi tottering regime, Carol on Sept. 5 appointed Ion Antonesc (*q.v.*) prime minister and conferred dictatorial powers upon him But Antonescu's first act was to demand Carol's abdication, an on Sept. 6 the king vacated the throne in favour of his son Miha (*q.v.*). Fleeing the country with his friend Magda Lupescu, h barely escaped assassination when his train was fired upon b Iron Guardists at the Yugoslav border. He travelled to Switzer land, then to Seville, Spain, where he arrived Oct. 13. Mean while the new government had conducted inquiries into his roya

come and threatened to ask his extradition from Spain. The panish government placed Carol and Lupescu under guard Oct. 2, but at the end of the year had returned neither to Bucharest.

aroline Islands: *see* PACIFIC ISLANDS, MANDATED.

arson, John Renshaw (1887–1940), U.S. research engineer, was born in Pittsburgh, Pa., ne 28, was graduated from Princeton university in 1907 and rsued graduate study in the Massachusetts Institute of Techology for the next year. He was an instructor in physics at rinceton from 1912 to 1914 and in the latter year was engaged y the American Telephone & Telegraph company as engineer of e development of transmission theory. He received the Elliott resson medal of the Franklin institute in recognition of his work perfecting electrical communication, and the Liebmann prize the Institute of Radio Engineers for his inventions in radio d his contributions to the theory of electrical circuits. He died New Hope, Pa., Oct. 31.

atastrophes: *see* DISASTERS.

atholic Church: *see* ROMAN CATHOLIC CHURCH.

atholic Rural Life Conference, National.

Vell planned to give practical information and zealous leadership rural life, the 18th annual convention was held at St. Cloud, Minn., in Oct., 1940. Pastors, teachers, farmers, homemakers, oung men and young women, in all some 10,000 delegates, took art in the discussion meetings.

Resolutions were passed to bring rural life to its proper orbit rough a great increase in the number of family-size, owner-perated farms. Adjustments of rural education to rural needs, e building of rural co-operative enterprises, the revitalization d conservation of the soil and improvements in economic, social nd religious situations in all parts of rural U.S. were carefully lanned. Founded in 1923 by the bishop of Kansas City, Mo., the Iost Rev. Edwin V. O'Hara, the conference devotes its efforts to are for the underprivileged Catholics on the land, to keep on the nd Catholics who are on the land, to settle more Catholics on e land, to bring economic, social and spiritual security to the J.S. agriculturist.

The conference co-operates with the National Catholic Rural ife Bureau of Washington, D.C., and state and federal agencies. ts publications are the *Manifesto on Rural Life, Catholic Rural ife Objectives, The Catholic Rural Life Bulletin* (the official uarterly magazine), and a series of pamphlets on the farm and he productive home. In addition to vacation schools for rural reas, a number of rural life summer schools for pastors and other ural leaders were conducted.

The Most Rev. Vincent J. Ryan of Bismarck, N.D., was relected president. Rt. Rev. Luigi G. Ligutti was elected executive ecretary. The conference headquarters were in 1940 at 525 Sixth venue, Des Moines, Ia. (F. X. T.)

atholic Welfare Conference, National.

Organized in Sept., 919 by the Catholic hierarchy of the United States, the N.C.W.C., as it is popularly called, is the unifying principle of atholic action. It is the common agency, acting under the auhority of the bishops, to promote the welfare of Catholics in the Jnited States. Its incorporated purposes specify "unifying, o-ordinating and organizing the Catholic people of the United tates in works of education, social welfare, immigrant aid and ther activities."

The conference operates under the authority of the 136 cardinals, archbishops and bishops of the United States. Reports are submitted to them, and authorization for new developments are sought from them, at their annual meeting in November. The N.C.W.C. was in 1940 governed by an administrative board of ten archbishops and bishops, assisted by seven supplementary bishops. Most Rev. Edward Mooney, archbishop of Detroit, Mich., succeeded Most Rev. Samuel A. Stritch, archbishop of Chicago, Ill., as chairman of the administrative board. Most Rev. John B. Peterson, bishop of Manchester, N.H., remained as vice-chairman. Most Rev. Francis J. Spellman, archbishop of N.Y., was named secretary. The Rt. Rev. Michael J. Ready was reappointed general secretary. The executive offices were moved to the building formerly known as the Apostolic Mission house, Catholic University of America, Washington, D.C. The official publication, *Catholic Action,* is published monthly.

Activities of the N.C.W.C. are directed through departments, bureaus and committees, each administered by an episcopal chairman. These include eight departments:

Executive.—Exercises general supervision, business and auditing, publications, etc.; maintains the Bureau of Immigration and assists the Confraternity of Christian Doctrine. *Education.*—Stimulates extension and efficiency of the Catholic school system, which embraces 2,606,362 students; engages in statistical and research work; studies legislation involving education. *Press.*—Issues the N.C.W.C. *News Service,* a weekly release supplied to 468 Catholic publications. *Social Action.*—Covers the field of family life, rural life, social welfare, industrial relations, international affairs. *Legal.*—Analyzes federal, state and local legislation affecting Catholic interests, and serves as an information centre on such matters. *Lay Organizations.*—Functions through the National Council of Catholic men and the National Council of Catholic women. The former is affiliated with other Catholic organizations of men, conducts a Catholic Evidence bureau and sponsors the weekly broadcast, "The Catholic Hour," heard over 95 radio stations. The latter flourishes in 63 dioceses of the United States, is affiliated with Catholic societies of women, and supports a school of social service. *Catholic Action Study.*—Investigates and reports on Catholic action at home and abroad. *Youth.*—Authorized in 1940 for the purpose of co-ordinating youth organizations and activities and furthering the National Catholic Youth council. *Committees.*—Among these are the following: Motion Pictures, which directs the Legion of Decency; Decent Literature; Catholic Refugees, which has collected $347,332; Polish Relief, which reached a total of $383,240. New projects approved were the establishment of a National Catholic Community service, to co-ordinate Catholic activities connected with U.S. preparedness and defence, and the reorganization of the American Board of Foreign Missions. (F. X. T.)

Cattle.

The number of cattle on United States farms and ranches increased by about 2,000,000 head in 1940, the department of agriculture estimated, and on Jan. 1, 1941 the total of cattle and calves had reached 70,800,000. The peak year was 1934, when there were 74,300,000 cattle and calves on United States farms and ranches. The severe droughts of 1934 and 1936 greatly reduced the herds so that there was a downward trend to a low of 66,100,000 head in 1938. Since then there has been a steady increase and the current rate of slaughter for beef and veal, the department estimated, should be about 26,000,000 head annually, or 10% over the number slaughtered in 1939 or 1940. The years 1939 and 1940 were approximately the same as to the number of animals slaughtered and the number on feed, 1940 being only slightly higher in both categories. The department of agriculture predicted in 1940 that the number of cattle in the

BRANDING CATTLE during a Texan roundup of 1940

United States would probably increase until 1945 and that the rate of slaughter might rise to 28,000,000 yearly before a downward trend in the cycle. Prices for prime beef cattle reached the highest level in three years in Oct. 1940, prime steers being about $2.50 per 100lb. higher on that date than a year earlier while good grades were about $2 higher. Lower grades were about the same as in 1939 and for the first nine months stockers and feeders at Kansas City averaged $8.54 per 100lb. in 1940 and $8.45 in 1939. Fewer cattle were on feed in 1940 in the eastern corn belt states, but in the western corn belt states the number increased. In the four months July–Sept. 1,292,000 feeders were shipped into eight principal feeding states compared with 1,164,000 shipped in 1939 into the same states, which are Iowa, Illinois, Ohio, Indiana, Michigan, Wisconsin, Minnesota and Nebraska. Imports of cattle (almost entirely from Canada and Mexico) were 480,000 head in the first nine months of 1940 and 611,000 in 1939. The Canadian shipments in that period were 179,000 head in 1940 and 232,000 in 1939; the Mexican, 301,000 in 1940 and 379,000 in 1939, consisting chiefly of young feeder cattle of 200 to 669 pounds. Canada may ship 52,000 head of cattle into the United States each quarter year at the reduced import duty of 1½ cents per lb. The Mexican quota is 8,280 head per quarter. The full import duty is 2½ cents per pound.

Livestock losses from German aeroplane bombing in the United Kingdom were "not so heavy as had been expected and are by no means excessive," Lloyd V. Steere, United States agricultural attaché at London, reported. Cattle and sheep suffered most owing to their habit of herding together when feeding in pastures, where most of the damage occurred rather than in barns. Much of the stock killed was salvaged and compensation was paid by the British food ministry. No compensation was paid where slain animals could not be used for food. German occupation of the Channel islands in the summer of 1940 caused a feeling of grave concern among United States breeders of Guernsey and Jersey catt which originated on the Channel islands of Guernsey and Jers where for centuries the two famous breeds have been develope and which provided the original foundation for the purebr Guernsey and Jersey herds in the United States and Canad Breeders' publications in the United States reported that no i formation could be obtained as to the disposition of the islar herds, numbering about 6,000 head on the island of Guernsey ar about 10,000 on the island of Jersey, after the occupation by Ge many. None of the cattle was evacuated. Although a majority the population was removed to England, island breeders refus to leave their herds. (*See* also MEAT.) (S. O. R.)

Celebes Islands: *see* DUTCH EAST INDIES; NETHERLAN COLONIAL EMPIRE.

Cellulose Products. With Russia taking Finland's wo pulp and Germany that of Norwa and Sweden, the United States and Canada were called on n only to meet increased domestic requirements but to supply Sou America, Africa, Asia, Australia and India in 1940.

Modification of old methods and development of new ones pe mitted the utilization of cellulose from such sources as Dougl fir, processed in the United States to give a high grade pul chestnut chips, a United States source of semichemical pulp f making corrugated paper and container board; cacao shells, pro essed by a German method to make rayon; southern yellow pin made commercially in the United States both into newsprint ar into rayon; cornstalks used in Hungary for making paper, and Italy for making rayon and cellulose derivatives including nitr cellulose; and ulla grass, made into wrapping paper in Indi

Bacterial control in pulp and paper making was desirable sin bacterial activity gives rise to slime, degrades stored pulp la causes fermentation of stock, rotting of felts and mildewing finished products. Chemicals found efficient for combatting su conditions are sodium pentachlorophenate and other synthet phenolic derivatives. Because of their nonreactivity these organ germicides have an advantage over chlorine; they are not quick spent.

A very light weight wood product suitable for structural i sulation was made by disintegrating wood waste or pulverized ja pine in water, treating with a foaming agent, drying and formi into sheets. Wood waste was used in making moulding powder f plastics and laminated wall board for structural sections, t latter type of product even being used for roof beams in prefab cated houses. Heat-treated under pressure, wood becomes e tremely dense, with the lignin naturally present itself serving as plastic.

This product has essentially the properties of a phenolic lam nated plastic and is competitive with such materials.

Notable improvements in old products included wrapping pap high in wet strength, book paper that will not crumble or yello with age, paper board with a better surface for printing, ar frozen-food containers resistant to moisture both within ar without.

Viscose was processed in a number of new ways: in Italy ar Belgium it was mixed with casein in the spinning solution to gi a new type of staple rayon fibre; in Great Britain and Germar synthetic resins were incorporated directly into the viscose spi ning solution and thus became an integral part of the fibre. R search was directed toward making rayon fibres more water-r pellent and more resilient. Other treatments resulted in the ma ing of carpets entirely from rayon and the making of blanke from mixtures of rayon with wool. Claimed to be three times strong as natural silk, a cellulose acetate yarn was in use f

naking parachutes for the R.A.F., filter cloths and conveyor belts. (*See* also PLASTICS INDUSTRY; RAYON.)

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Cement. Total cement production in the United States rose 16% in 1939, to 124,698,000 barrels. The great bulk of the output was the ordinary Portland cement; the special types of masonry, natural and pozzolanic cements averaged only 1–2% of the total, while high-early-strength cement increased to 3%.

Both production and shipments in the United States in 1940 were estimated to be about 6% ahead of 1939, at about 129,000,000 bbl., with shipments probably slightly in the lead, as in 1939. Canadian production in 1939 totalled 5,731,000bbl., and through Sept. 1940 was 12·5% ahead of the same period of 1939, indicating that the total for the year would be about 7,000,000 barrels.

World production, estimated at 88,850,000 metric tons in 1938, was distributed as follows: United States 22%; Germany 17%; United Kingdom 9%; Japan 7%; U.S.S.R. 6%; Italy 5%; France 5%; Belgium 3%; Czechoslovakia, Poland, India, Canada, South Africa, Yugoslavia and Australia 9%; the remaining 17% is widely scattered in small amounts. (*See* also GYPSUM.)

(G. A. RO.)

Census, 1940. The 1940 census of population is the 16th such census to be taken in the United States. The first census, taken in 1790, covered the territory now occupied by 18 states and showed a total population of a little less than 4,000,000. The main purpose of the census, under the provisions made for it in the constitution, was to secure a basis for the apportionment of representation (and direct taxes) among the states, in accordance with the number of persons residing in the several states. The apportionment population was a purely quantitative measure, except for the one element of quality embodied in the provision that five slaves should be considered equivalent to three free persons. Decade by decade additional items of classification have been added to the census program, however, so that the present-day census is far from the simple count of population classified only by sex, colour, status as free or slave, and broad age groups, with which the series of decennial censuses was initiated. Even now, however, inquiries for purely quantitative data, namely, the total population of specified areas on specified dates, are more frequent than any other one kind of inquiry received by the Census bureau.

The first item of information to be made available from any census for the United States and its thousands of political subdivisions (states, counties, cities, towns, villages, townships, etc.) is this simple count of the population. In the 1940 census this was followed closely by the count of dwelling units from the housing inquiry, these being classified as occupied and vacant and the number of occupied dwelling units being approximately the same as the number of households or families. Ordinarily, no further classifications of population would be available until after the completion of the preparation and tabulation of the punched cards—one for each person in the population. Provision was made in the 1940 census, however, for the selection of a 5% random sample, and from this sample have been punched preliminary cards from the tabulation of which certain fundamentally important classifications are (Feb. 1941) available, several months in advance of the earliest possible date on which the tabulation of the whole number of population cards can be completed. Data from this source relating to a number of topics are presented below.

Population Growth.—The population of continental United States on April 1, 1940, the date of the 16th census, was 131,669,275, as compared with 122,775,046 on April 1, 1930, the date of the 15th census. The increase in population during the decade ending in 1940 thus amounted to 8,894,229 persons. While this is a considerable number, it represents a gain of only 7·2% which is the smallest relative increase ever recorded in U.S. census history.

In 1790, when the first census was taken, the population was just short of 4,000,000. Each subsequent decennial census up to 1860 showed an increase of about one-third over the preceding one; from 1860 to 1910 the decennial increase was around 20 or 25%; for the next two census decades the figures were 14·9% and 16·1%, respectively; and for the period from 1930 to 1940 the increase, as indicated above, was only 7·2%, or less than one-half the smallest previous increase. The data for the 16 censuses are given in Table I.

Table I.—*Population of the United States: 1790 to 1940*

Census year	Population	Increase over preceding census	
		Number	Per cent
1940	131,669,275	8,894,229	7.2
1930	122,775,046	17,064,426	16.1
1920	105,710,620	13,738,354	14.9
1910	91,972,266	15,977,691	21.0
1900	75,994,575	13,046,861	20.7
1890	62,947,714	12,791,931	25.5
1880	50,155,783	10,337,334*	26.0
1870	39,818,449*	8,375,128*	26.6
1860	31,443,321	8,251,445	35.6
1850	23,191,876	6,122,423	35.9
1840	17,069,453	4,203,433	32.7
1830	12,866,020	3,227,567	33.5
1820	9,638,453	2,398,572	33.1
1810	7,239,881	1,931,398	36.4
1800	5,308,483	1,379,269	35.1
1790	3,929,214	..	..

*Revised figure.

Immigration and Emigration.—The two principal causes for the slowing down of population growth are the cessation of foreign immigration and the decrease in the birth rate. During the decade 1930–40, emigration exceeded immigration. The observed population growth during this decade is therefore due entirely to natural increase, the excess of births over deaths. In fact, for the first time in the history of the United States, the number of emigrants during an intercensual period was greater than the number of immigrants. During the decade from April 1, 1930, to April 1, 1940, the number of persons who left the United States for foreign lands exceeded by 46,518 the number who entered the United States. This is in sharp contrast with the period between 1920 and 1930, when the net immigration amounted to about 3,250,000. This change alone explains a considerable part—though by no means the greater part—of the reduction in the average annual population increase from 1,700,000 between 1920 and 1930 to about 900,000 in the decade just past.

Birth and Death Rate.—The progressive decline in the birth and death rates is shown in Table II. The states which were in the birth registration area in 1920 had a collective rate of 23·7 per 1,000. In 1930 the states then in the registration area had a rate of 18·9. The lowest observed rate was that for the depression year of 1933, 16·6. Since then the birth rate has risen somewhat, but it was still only 17·3 per 1,000 in 1939. Death rates have likewise fallen from 13·0 per 1,000 in 1920 to 11·4 in 1930 and 10·6 in 1939. The downward trends in these two rates are of great significance in their influence on population characteristics. A falling birth rate means that the United

States population will increase more and more slowly, and eventually become stationary or even begin to decline. On the assumption that present trends will continue, it is estimated that the population will be about 139,000,000 in 1950 and about 144,000,000 in 1960. By perhaps 1970 or 1980 the population will probably have reached its maximum and will remain stationary or even begin to decline.

Table II.—*Births and Deaths in the United States: 1920 to 1940*

(In 1920 the birth registration area included 59.8% of the total population of the country, and the death registration area 82.2%. These areas were gradually extended, until in 1933 both areas included the entire country. The figures shown in this table for the years 1920 to 1932 include estimates for that part of the country not in the registration area)

Year	Number of births (thousands)	Number of deaths (thousands)	Excess of births over deaths (thousands)	Rate per 1,000 of the population		
				Births	Deaths	Excess of births
1939	2,266	1,388	878	17.3	10.6	6.7
1938	2,287	1,381	906	17.6	10.7	7.0
1937	2,203	1,450	753	17.1	11.3	5.8
1936	2,145	1,479	666	16.8	11.6	5.2
1935	2,155	1,393	762	17.0	11.0	6.0
1934	2,168	1,397	771	17.2	11.1	6.1
1933	2,081	1,342	739	16.6	10.7	5.9
1932	2,178	1,360	818	17.5	10.9	6.6
1931	2,232	1,374	858	18.0	11.1	6.9
1930	2,328	1,396	932	18.9	11.4	7.6
1929	2,291	1,448	843	18.9	11.9	6.9
1928	2,368	1,446	922	19.8	12.1	7.7
1927	2,440	1,352	1,088	20.6	11.4	9.2
1926	2,412	1,428	984	20.7	12.3	8.4
1925	2,467	1,360	1,107	21.5	11.8	9.6
1924	2,534	1,328	1,206	22.4	11.7	10.7
1923	2,478	1,360	1,118	22.2	12.2	10.0
1922	2,456	1,290	1,166	22.3	11.7	10.6
1921	2,622	1,253	1,369	24.2	11.6	12.7
1920	2,522	1,389	1,133	23.7	13.0	10.6

The decreasing death rate reflects the increasing length of life. This is shown by the fact that the life expectation of white males increased from about 48 years in 1901 to about 59 years in 1930, and that of white females from about 51 years in the earlier period to over 62 years in 1930. Since 1930 the life expectation has probably increased still further, although exact data are not yet available.

To summarize the birth and death rates in another fashion, we may note that the net reproduction rate for the United States is decreasing rapidly, having fallen from 111 in 1930 to about 96 in 1940. This rate is a measure of the degree to which a population will eventually reproduce itself; a net rate of 100 would mean that birth and death rates were such that the population in the long run would neither increase nor decrease. The net reproduction rate of 96, therefore, means that under present fertility and mortality conditions the population of the United States will eventually fail to maintain its numbers by approximately 4% per generation. A significant difference in this respect exists between the white and nonwhite population of the United States. If present birth and death rates continue, the nonwhite population of the United States will, in the long run, increase at the rate of about 7% per generation, while the white population will decrease at the rate of about 5% per generation.

With the cessation of immigration and the decline in the birth rate, changes in the character of our population will take place. To some of these, especially the increase in average age and the decrease in the proportion of males, specific reference is made below (*see* p. 142).

Urban and Rural Population.—One of the fundamental classifications of the population of the United States is that which separates the urban population from the rural. The urban population comprises, in general, all persons living in incorporated places (cities, towns, villages or boroughs) having a population of 2,500 or more; while the rural population is made up of persons living outside such places. On April 1, 1940, the urban population numbered 74,423,702 and the rural population 57,245,573. In 1930 the urban population was 68,954,823 and the rural population 53,820,223. The increase in the urban population between 1930 and 1940 thus amounted to 5,468,879, or 7.9%, and the increase in the rural population to 3,425,350, or 6.4%. The urban population now forms 56.5% of the total population of the United States, as compared with 56.2% in 1930.

The growth of the urban population was very much slower in the decade just past than in the period between 1920 and 1930—7.9% as compared with 27.3%. This is partly the result of the slowing down in the rate of growth of the total population from 16.1% between 1920 and 1930 to 7.2% between 1930 and 1940. The increase in the rural population during the most recent decade, however, was more rapid than in the period between 1920 and 1930—6.4% as compared with 4.4%.

The recent increase in the relative importance of rural growth may be brought out even more clearly by comparing directly the urban and rural rates for each of the last two decades. Between 1920 and 1930 the rate of urban growth was more than six times the rate of rural growth (27.3 as against 4.4), while during the decade just past the rate of urban growth was only slightly higher than the rural rate (7.9 as compared with 6.4).

The total increase in the population of the United States between 1930 and 1940 was 8,894,229. Of this amount the increase in urban places (5,468,879) accounted for 61.5% and that in rural areas (3,425,350) for 38.5%. On the basis of absolute numbers, then, the urban increase was substantially larger than the rural.

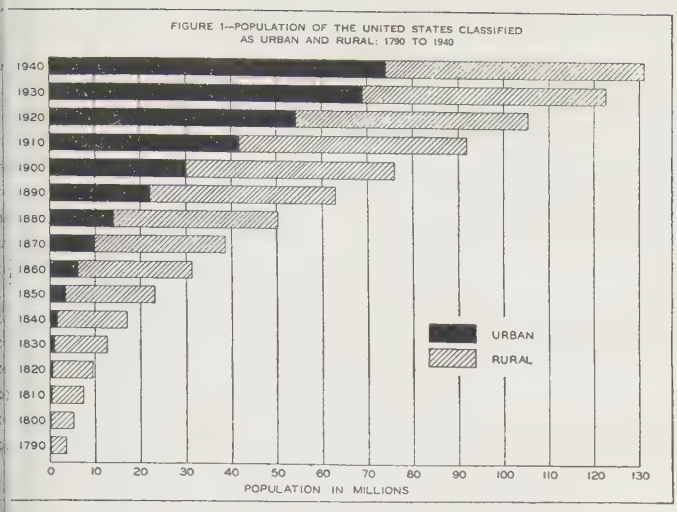
The marked decline in the rate of urban growth is attributable in large measure to the economic conditions of the past decade. These conditions have slowed down the movement of population from rural to urban areas, and have also reduced somewhat the rate of natural increase. Hence the urban areas have grown far less, in comparison with past decades, from the inflow of rural inhabitants, and somewhat less from the excess of births over deaths. Finally, immigration from foreign countries, which is at least partially related to economic conditions in the U.S., virtually ceased during the 1930s. In past decades such immigration has contributed greatly to urban growth; in the period from 1930 to 1940, during which net immigration was a minus quantity and gross immigration only a few hundred thousand, it is obvious that immigration could have contributed very little.

The urban and rural population figures from 1790 to 1940 are summarized in Table III and shown graphically in fig. 1, which, incidentally, indicates also the growth of the total population over the 150 years covered by census data.

Table III.—*Population of the United States Classified as Urban and Rural: 1790 to 1940*

(Classified in accordance with method followed in 1930 and 1940; previously published figures for 1880 to 1920 revised accordingly)

Census year	Total population	Urban population		Rural population	
		Number	Per cent of total	Number	Per cent of total
1940	131,669,275	74,423,702	56.5	57,245,573	43.5
1930	122,775,046	68,954,823	56.2	53,820,223	43.8
1920	105,710,620	54,157,973	51.2	51,552,647	48.8
1910	91,972,266	41,998,932	45.7	49,973,334	54.3
1900	75,994,575	30,159,921	39.7	45,834,654	60.3
1890	62,947,714	22,106,265	35.1	40,841,449	64.9
1880	50,155,783	14,129,735	28.2	36,026,048	71.8
1870	38,558,371	9,902,361	25.7	28,656,010	74.3
1860	31,443,321	6,216,518	19.8	25,226,803	80.2
1850	23,191,876	3,543,716	15.3	19,648,160	84.7
1840	17,069,453	1,845,055	10.8	15,224,398	89.2
1830	12,866,020	1,127,247	8.8	11,738,773	91.2
1820	9,638,453	693,255	7.2	8,945,198	92.8
1810	7,239,881	525,459	7.3	6,714,422	92.7
1800	5,308,483	322,371	6.1	4,986,112	93.9
1790	3,929,214	201,655	5.1	3,727,559	94.9



The increase in the relative importance of the urban population during the first 30 or 40 years of the nation's history was very slow, as between 1790 and 1830 the percentage urban had increased only from 5·1 to 8·8. Beginning with 1850, however, the increase in the proportion of the population living in urban places was fairly rapid, running parallel with the increase in the relative importance of non-agricultural employment. This urban movement continued until 1930, but since 1930 the increase in city population has been relatively slow; and the smaller cities have grown somewhat more rapidly than those having a population of 100,000 or more.

Population by States.—The population is shown by geographic divisions and states for 1940 and 1930, with urban and rural data, in Table IV (*see* p. 140). The increase in population from 1930 to 1940 is also shown graphically on the accompanying map (fig. 2).

The District of Columbia, with an increase of 36·2%, grew faster between 1930 and 1940 than any of the states. The fastest growing state was Florida, with an increase of 29·2%, followed by New Mexico, with 25·6% and California, with 21·7%. Six states, namely, Kansas, Nebraska, North Dakota, Oklahoma, South Dakota and Vermont, lost population between 1930 and 1940. The first five of these states are located in the Great Plains and constitute a tier of states in the dust bowl extending from Canada to Texas. In no previous decade have more than three states lost population. In absolute amount, the increase of population in California was considerably greater than in any other state, being 1,230,136 as compared with 891,076 in New York, the next state in this respect. In ten other states, Texas, Florida, Michigan, North Carolina, Tennessee, Pennsylvania, Illinois, Louisiana, Ohio and Virginia, increase in population between 1930 and 1940 exceeded 250,000.

Taking the states in large groups, it may be noted that all of the northern states, that is, the first four of the geographic divisions shown in Table IV, which had nearly 60% of the 1930 population, show only about one-third of the increase between 1930 and 1940. The southern states, however, comprising the next three geographic divisions as shown in the table, which had less than 31% of the 1930 population, show nearly 43% of the increase; and the western states, comprising the Mountain and Pacific divisions, which had less than 10% of the 1930 population, show more than 22% of the increase.

It may be noted that practically all of the industrial states show a rate of increase less than the national average, and that even if the dust bowl states, with actual decreases in population, were omitted, the four northern divisions would still show a much smaller fraction of the increase than they had of the actual population either in 1930 or 1940. To some extent, the relatively more rapid rate of increase in the southern states is the result of their higher birth rates, coupled with the fact that, under present employment conditions, a much larger fraction of their population increase has probably remained within these states than in recent previous decades. The increase on the Pacific coast probably represents the continued settlement and development of new territory, since these states represent the last of the well watered lands to be occupied in continental United States. The especially rapid growth in California is presumably attributable also to the tendency of certain classes of the population to migrate toward areas of a warmer climate, this same tendency probably explaining also the rapid growth in Florida.

The very slight change in the urban-rural distribution of the population which has been indicated above for the country as a whole is the result of the averaging of conditions differing rather widely as between one part of the country and another. In general, the urban percentages have gone down in those regions and states where they were high, and have increased in those regions where they were low.

Specifically, in four of the geographic divisions, the New England, Middle Atlantic, East North Central and Pacific, the percentage of the population urban in 1940 was lower than in 1930, this resulting, of course, from a rural increase at a rate higher than the urban rate. In the Middle Atlantic division, for example, the rural population gained 9·0% and the urban only 3·7%, with the result that the percentage urban was reduced from 77·7 in 1930 to 76·8 in 1940. All except three of the states in these four divisions likewise show a lower percentage urban in

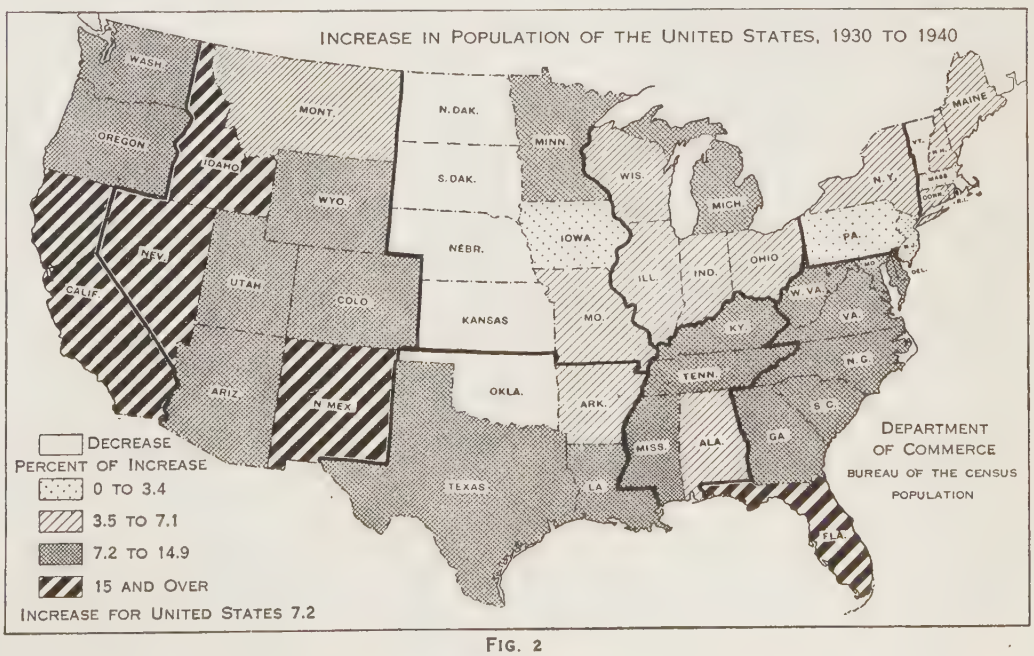


FIG. 2

Table IV.—*Population of the United States, Urban and Rural, by States: 1940*

(A minus sign [−] denotes decrease)

Division and state	Total population					Urban, 1940		Rural, 1940		Per cent urban	
	1940	1930	Increase, 1930–40	Per cent of increase		Number	Pct. incr. over 1930	Number	Pct. incr. over 1930	1940	1930
				1930–40	1920–30						
United States	131,669,275	122,775,046	8,894,229	7.2	16.1	74,423,702	7.9	57,245,573	6.4	56.5	56.2
Geographic divisions:											
New England	8,437,290	8,166,341	270,949	3.3	10.3	6,420,542	1.7	2,016,748	8.8	76.1	77.3
Middle Atlantic	27,539,487	26,260,750	1,278,737	4.9	18.0	21,147,543	3.7	6,391,944	9.0	76.8	77.7
East north central	26,626,342	25,297,185	1,329,157	5.3	17.8	17,444,359	3.9	9,181,983	8.0	65.5	66.4
West north central	13,516,990	13,296,915	220,075	1.7	6.0	5,993,124	7.9	7,523,866	−2.8	44.3	41.8
South Atlantic	17,823,151	15,793,589	2,029,562	12.9	12.9	6,921,726	21.5	10,901,425	8.0	38.8	36.1
East south central	10,778,225	9,887,214	891,011	9.0	11.2	3,165,356	13.9	7,612,869	7.1	29.4	28.1
West south central	13,064,525	12,176,830	887,695	7.3	18.9	5,203,401	17.5	7,861,124	1.4	39.8	36.4
Mountain	4,150,003	3,701,789	448,214	12.1	11.0	1,771,742	21.5	2,378,261	6.0	42.7	39.4
Pacific	9,733,262	8,194,433	1,538,829	18.8	47.2	6,355,909	14.8	3,377,353	27.0	65.3	67.5
New England:											
Maine	847,226	797,423	49,803	6.2	3.8	343,057	6.7	504,169	5.9	40.5	40.3
New Hampshire	491,524	465,293	26,231	5.6	5.0	283,225	3.7	208,299	8.4	57.6	58.7
Vermont	359,231	359,611	−380	−0.1	2.0	123,239	3.8	235,992	−2.0	34.3	33.0
Massachusetts	4,316,721	4,249,614	67,107	1.6	10.3	3,859,476	0.7	457,245	9.3	89.4	90.2
Rhode Island	713,346	687,497	25,849	3.8	13.7	653,383	2.8	59,963	15.2	91.6	92.4
Connecticut	1,709,242	1,606,903	102,339	6.4	16.4	1,158,162	2.3	551,080	16.0	67.8	70.4
Middle Atlantic:											
New York	13,479,142	12,588,066	891,076	7.1	21.2	11,165,893	6.1	2,313,249	12.0	82.8	83.6
New Jersey	4,160,165	4,041,334	118,831	2.9	28.1	3,394,773	1.7	765,392	9.0	81.6	82.6
Pennsylvania	9,900,180	9,631,350	268,830	2.8	10.5	6,586,877	0.8	3,313,303	7.0	66.5	67.8
East north central:											
Ohio	6,907,612	6,646,697	260,915	3.9	15.4	4,612,986	2.3	2,294,626	7.3	66.8	67.8
Indiana	3,427,796	3,238,503	189,293	5.8	10.5	1,887,712	5.1	1,540,084	6.8	55.1	55.5
Illinois	7,897,241	7,630,654	266,587	3.5	17.7	5,809,650	3.1	2,087,591	4.6	73.6	73.9
Michigan	5,256,106	4,842,325	413,781	8.5	32.0	3,454,867	4.6	1,801,239	16.9	65.7	68.2
Wisconsin	3,137,587	2,939,006	198,581	6.8	11.7	1,679,144	8.1	1,458,443	5.3	53.5	52.9
West north central:											
Minnesota	2,792,300	2,563,953	228,347	8.9	7.4	1,390,098	10.5	1,402,202	7.3	49.8	49.0
Iowa	2,538,268	2,470,939	67,329	2.7	2.8	1,084,231	10.7	1,454,037	−2.5	42.7	39.6
Missouri	3,784,664	3,629,367	155,297	4.3	6.6	1,960,696	5.5	1,823,968	3.0	51.8	51.2
North Dakota	641,935	680,845	−38,910	−5.7	5.3	131,923	16.4	510,012	−10.1	20.6	16.6
South Dakota	642,961	692,849	−49,888	−7.2	8.8	158,087	20.8	484,874	−13.7	24.6	18.9
Nebraska	1,315,834	1,377,963	−62,129	−4.5	6.3	514,148	5.8	801,686	−10.1	39.1	35.3
Kansas	1,801,028	1,880,999	−79,971	−4.3	6.3	753,941	3.3	1,047,087	−9.0	41.9	38.8
South Atlantic:											
Delaware	266,505	238,380	28,125	11.8	6.9	139,432	13.2	127,073	10.3	52.3	51.7
Maryland	1,821,244	1,631,526	189,718	11.6	12.5	1,080,351	10.8	740,893	12.8	59.3	59.8
Dist. of Columbia	663,091	486,869	176,222	36.2	11.3	663,091	36.2	..	..	100.0	100.0
Virginia	2,677,773	2,421,851	255,922	10.6	4.9	944,675	20.3	1,733,098	5.9	35.3	32.4
West Virginia	1,901,974	1,729,205	172,769	10.0	18.1	534,292	8.7	1,367,682	10.5	28.1	28.4
North Carolina	3,571,623	3,170,276	401,347	12.7	23.9	974,175	20.3	2,597,448	10.0	27.3	25.5
South Carolina	1,899,804	1,738,765	161,039	9.3	3.3	466,111	25.6	1,433,693	4.8	24.5	21.3
Georgia	3,123,723	2,908,506	215,217	7.4	0.4	1,073,808	19.9	2,049,915	1.8	34.4	30.8
Florida	1,897,414	1,468,211	429,203	29.2	51.6	1,045,791	37.6	851,623	20.2	55.1	51.7
East south central:											
Kentucky	2,845,627	2,614,589	231,038	8.8	8.2	849,327	6.3	1,996,300	10.0	29.8	30.6
Tennessee	2,915,841	2,616,556	299,285	11.4	11.9	1,027,206	14.6	1,888,635	9.8	35.2	34.3
Alabama	2,832,961	2,646,248	186,713	7.1	12.7	855,941	15.0	1,977,020	3.9	30.2	28.1
Mississippi	2,183,796	2,009,821	173,975	8.7	12.2	432,882	27.8	1,750,914	4.8	19.8	16.9
West south central:											
Arkansas	1,949,387	1,854,482	94,905	5.1	5.8	431,910	12.8	1,517,477	3.1	22.2	20.6
Louisiana	2,363,880	2,101,593	262,287	12.5	16.9	980,439	17.6	1,383,441	9.1	41.5	39.7
Oklahoma	2,336,434	2,396,040	−59,606	−2.5	18.1	879,663	7.1	1,456,771	−7.5	37.6	34.3
Texas	6,414,824	5,824,715	590,109	10.1	24.9	2,911,389	21.8	3,503,435	2.0	45.4	41.0
Mountain:											
Montana	559,456	537,606	21,850	4.1	−2.1	211,535	16.8	347,921	−2.4	37.8	33.7
Idaho	524,873	445,032	79,841	17.9	3.0	176,708	36.4	348,165	10.3	33.7	29.1
Wyoming	250,742	225,565	25,177	11.2	16.0	93,577	33.5	157,165	1.1	37.3	31.1
Colorado	1,123,296	1,035,791	87,505	8.4	10.2	590,756	13.6	532,540	3.2	52.6	50.2
New Mexico	531,818	423,317	108,501	25.6	17.5	176,401	65.1	355,417	12.3	33.2	25.2
Arizona	499,261	435,573	63,688	14.6	30.3	173,981	16.1	325,280	13.8	34.8	34.4
Utah	550,310	507,847	42,463	8.4	13.0	305,493	14.7	244,817	1.3	55.5	52.4
Nevada	110,247	91,058	19,189	21.1	17.6	43,291	25.6	66,956	18.3	39.3	37.8
Pacific:											
Washington	1,736,191	1,563,396	172,795	11.1	15.2	921,969	4.2	814,222	19.9	53.1	56.6
Oregon	1,089,684	953,786	135,898	14.2	21.8	531,675	8.6	558,009	20.3	48.8	51.3
California	6,907,387	5,677,251	1,230,136	21.7	65.7	4,902,265	17.8	2,005,122	32.2	71.0	73.3

1940 than in 1930.

On the other hand, the percentage urban increased materially between 1930 and 1940 in the West North Central division, where several of the states show an actual loss of rural population, in conjunction with at least a moderate gain in urban areas; in the three southern divisions, where only three out of the 16 states form exceptions to the general rule; and in the Mountain division, where all the states share the increase in percentage urban, which, in some of the states with large total population increases, is considerable. In New Mexico, for example, the urban population increased 65·1% and the rural only 12·3, with a resulting change in the percentage urban from 25·2 in 1930 to 33·2 in 1940.

The population of the United States and all its territories and possessions, including the Philippines, in 1940, was 150,621,231, as indicated in Table V (*see* p. 141). This figure represents an increase of 12,182,162, or 8·8%, over the 1930 population of 138,439,069. Excluding the Philippine islands (for which only estimated figures are available), there were 134,265,23 persons in continental United States and the territories and possessions on April 1, 1940 as compared with 124,926,06 in 1930, an increase of 9,339,162, or 7·5%.

In contrast with continental United States, the territories and possessions as a group, not considering the Philippines, grew a little faster during the decade 1930–40 than they had in the previous ten years, gaining 20·7% as compared with 19·6%. In Alaska, American Samoa and Puerto Rico the rates of growth during the decade 1930–40 were above those for the period 1920–30. In Hawaii, on the other hand, population growth has decreased markedly since 1930 as compared with previous periods. In the decade 1930–40 the Hawaiian population increased by 14·9% as compared with 43·9% in the previous decade and 33·4% in the decade 1910–20.

The population of Alaska decreased by 14·5% between 1910 and 1920, then increased by 7·7% during the following ten years, and increased 22·3% in the decade just ended. Puerto Rico, in contrast to Alaska, has shown considerably less change from one census to the next but nevertheless has grown more rapidly during each successive decade—16·3% in the period 1910–20, 18·8% in the period 1920–30 and 21·1% in the ten years 1930–40.

Apportionment. — One of the important functions—perhaps still the most important single function—which the census serves is that of providing a basis for the reapportionment of representation in the house of representatives. Such a reapportionment has been made by Congress following each census except that of 1920. In the law providing for the census of 1930 (under which the 1940 census also was taken) provision is made that, if Congress does not act within a specified time, reapportionment on the basis of the new census goes into effect without specific legislation. This law requires that the President submit to Congress at the first session subsequent to the decennial census a statement showing the new population of each state and the number of representatives to which each state would be entitled on the basis of these figures, (a) under the method of apportionment last used, (b) under the method known as "major fractions," and (c) under the method known as "equal proportions." Since the method last used was that of major fractions, this means that for 1940 the apportionment need be worked

Table V.—*Population of the United States and Its Territories and Possessions: 1940*

Area	Population		Increase	
	1940	1930	Amount	Per cent
nited States and all territories and possessions	150,621,231	138,439,069	12,182,162	8.8
nited States and territories and possessions, excluding Philippine islands	134,265,231	124,926,069	9,339,162	7.5
ontinental United States	131,069,275	122,775,046	8,894,229	7.2
erritories and possessions, excluding Philippine islands	2,595,956	2,151,023	444,933	20.7
Alaska	*72,524	*59,278	13,246	22.3
American Samoa	12,908	10,055	2,853	28.4
Guam	22,290	18,509	3,781	20.4
Hawaii	423,330	368,336	54,994	14.9
Panama Canal Zone	51,827	39,467	12,360	31.3
Puerto Rico	1,869,255	1,543,913	325,342	21.1
Virgin islands	24,889	22,012	2,877	13.1
Military and naval services, etc., abroad	118,933	89,453	29,480	33.0
hilippine islands	†16,356,000	‡13,513,000	2,843,000	21.0

*Census taken as of Oct. 1 of the preceding year.
†Estimate derived by extrapolation from the census figures for 1918 (10,314,310) and 939 (16,000,303).
‡Estimate derived by interpolation from the census figures for 1918 and 1939.

ut by only two methods—the two methods specifically mentioned bove. Under the method of major fractions the state of California gains three representatives, and seven other states, namely, rizona, Florida, Michigan, New Mexico, North Carolina, Oregon nd Tennessee each gain one. To balance these gains, since the umber of representatives in the house is not to be changed, the ollowing ten states each lose one representative, namely, Arkansas, Illinois, Indiana, Iowa, Kansas, Massachusetts, Nebraska, hio, Oklahoma and Pennsylvania. The apportionment under the ethod of equal proportions differs in only one respect from that ust outlined, namely, that Michigan and Arkansas keep their resent numbers of representatives instead of gaining one and osing one, respectively. *See* table of Apportionments, p. 144A.

Individual Cities.—According to the returns of the 1940 census there were 92 cities in the United States having 100,000 inabitants or more, the total population of these cities being 37,87,989. These 92 cities had a population of 36,195,171 persons in 930, showing an increase of 1,792,818 during the decade. This hange represents an increase in population of 5.0% between 930 and 1940, as compared with 23.7% for the same cities beween 1920 and 1930. It is evident from these figures that the arger cities have been growing much less rapidly since 1930 than luring the preceding decade.

The number of cities with a population of 100,000 or more was ne less in 1940 than in 1930—92 as compared with 93. Sacramento, Calif. and Charlotte, N.C., were newcomers to the list, vhile El Paso, Tex., Lynn, Mass. and Evansville, Ind. dropped elow 100,000 between 1930 and 1940.

The population of the 93 cities which had a population of 100,000 or more in 1930 was 36,325,736. As compared with this figure, he population of the 92 cities of 100,000 or more in 1940 represents an increase of 4.6%, the lower percentage (as compared with the 5.0% given above for identical cities) being the result of he net loss of one city from the group.

Twenty-eight of the cities lost population between 1930 and 940, as compared with only four of the same cities between 1920 nd 1930. Three cities, Fall River and Lowell, Mass. and Wilmington, Del., reversed declines observed between 1920 and 1930 nd showed slight increases in the last decade. Only one city, Washington, D.C., grew more rapidly between 1930 and 1940 than etween 1920 and 1930.

The most rapid growth between 1930 and 1940 occurred in Miami, Fla., which increased by 55.6%. San Diego, Calif. (37.4%), and Washington, D.C. (36.2%), were second and third respectively. It may be noted that no city in the New England or Middle Atlantic division shows an increase of more than 10%.

The population of all cities and other urban places (villages, towns, boroughs, etc.) of 5,000 or more, arranged alphabetically by states, is shown, for 1940 and 1930, in Table XVII at the end of this article.

Table VI.—*Population of Cities of 100,000 or More, Arranged According to Size: 1940 and 1930*

(A minus sign [—] denotes decrease)

City	Population		Increase, 1930–40	Per cent of increase	
	1940	1930		1930–40	1920–30
1. New York, N.Y.	7,454,995	6,930,446	524,549	7.6	23.3
2. Chicago, Ill.	3,396,808	3,376,438	20,370	0.6	25.0
3. Philadelphia, Pa.	1,931,334	1,950,961	—19,627	—1.0	7.0
4. Detroit, Mich.	1,623,452	1,568,662	54,790	3.5	57.9
5. Los Angeles, Calif.	1,504,277	1,238,048	266,229	21.5	114.7
6. Cleveland, Ohio	878,336	900,429	—22,093	—2.5	13.0
7. Baltimore, Md.	859,100	804,874	54,226	6.7	9.7
8. St. Louis, Mo.	816,048	821,960	—5,912	—0.7	6.3
9. Boston, Mass.	770,816	781,188	—10,372	—1.3	4.4
10. Pittsburgh, Pa.	671,659	669,817	1,842	0.3	13.8
11. Washington, D.C.	663,091	486,869	176,222	36.2	11.3
12. San Francisco, Calif.	634,536	634,394	142	(*)	25.2
13. Milwaukee, Wis.	587,472	578,249	9,223	1.6	26.5
14. Buffalo, N.Y.	575,901	573,076	2,825	0.5	13.1
15. New Orleans, La.	494,537	458,762	35,775	7.8	18.5
16. Minneapolis, Minn.	492,370	464,356	28,014	6.0	22.0
17. Cincinnati, Ohio	455,610	451,160	4,450	1.0	12.4
18. Newark, N.J.	429,760	442,337	—12,577	—2.8	6.7
19. Kansas City, Mo.	399,178	399,746	—568	—0.1	23.2
20. Indianapolis, Ind.	386,972	364,161	22,811	6.3	15.9
21. Houston, Texas	384,514	292,352	92,162	31.5	111.4
22. Seattle, Wash.	368,302	365,583	2,719	0.7	15.9
23. Rochester, N.Y.	324,975	328,132	—3,157	—1.0	10.9
24. Denver, Colo.	322,412	287,861	34,551	12.0	12.2
25. Louisville, Ky.	319,077	307,745	11,332	3.7	31.0
26. Columbus, Ohio	306,087	290,564	15,523	5.3	22.6
27. Portland, Ore.	305,394	301,815	3,579	1.2	16.9
28. Atlanta, Ga.	302,288	270,366	31,922	11.8	34.8
29. Oakland, Calif.	302,163	284,063	18,100	6.4	31.4
30. Jersey City, N.J.	301,173	316,715	—15,542	—4.9	6.2
31. Dallas, Texas	294,734	260,475	34,259	13.2	63.8
32. Memphis, Tenn.	292,942	253,143	39,799	15.7	55.9
33. St. Paul, Minn.	287,736	271,606	16,130	5.9	15.7
34. Toledo, Ohio	282,349	290,718	—8,369	—2.9	19.6
35. Birmingham, Ala.	267,583	259,678	7,905	3.0	45.2
36. San Antonio, Texas	253,854	231,542	22,312	9.6	43.5
37. Providence, R.I.	253,504	252,981	523	0.2	6.5
38. Akron, Ohio	244,791	255,040	—10,249	—4.0	22.4
39. Omaha, Neb.	223,844	214,006	9,838	4.6	11.7
40. Dayton, Ohio	210,718	200,982	9,736	4.8	31.7
41. Syracuse, N.Y.	205,967	209,326	—3,359	—1.6	21.9
42. Oklahoma City, Okla.	204,424	185,389	19,035	10.3	103.1
43. San Diego, Calif.	203,341	147,995	55,346	37.4	99.0
44. Worcester, Mass.	193,694	195,311	—1,617	—0.8	8.7
45. Richmond, Va.	193,042	182,929	10,113	5.5	6.6
46. Fort Worth, Texas	177,662	163,447	14,215	8.7	53.5
47. Jacksonville, Fla.	173,065	129,549	43,516	33.6	41.5
48. Miami, Fla.	172,172	110,637	61,535	55.6	274.1
49. Youngstown, Ohio	167,720	170,002	—2,282	—1.3	28.4
50. Nashville, Tenn.	167,402	153,866	13,536	8.8	30.0
51. Hartford, Conn.	166,267	164,072	2,195	1.3	18.9
52. Grand Rapids, Mich.	164,292	168,592	—4,300	—2.6	22.5
53. Long Beach, Calif.	164,271	142,032	22,239	15.7	155.5
54. New Haven, Conn.	160,605	162,655	—2,050	—1.3	0.1
55. Des Moines, Iowa	159,819	142,559	17,260	12.1	12.7
56. Flint, Mich.	151,543	156,492	—4,949	—3.2	70.8
57. Salt Lake City, Utah	149,934	140,267	9,667	6.9	18.8
58. Springfield, Mass.	149,554	149,900	—346	—0.2	15.7
59. Bridgeport, Conn.	147,121	146,716	405	0.3	2.2
60. Norfolk, Va.	144,332	129,710	14,622	11.3	12.0
61. Yonkers, N.Y.	142,598	134,646	7,952	5.9	34.4
62. Tulsa, Okla.	142,157	141,258	899	0.6	96.0
63. Scranton, Pa.	140,404	143,433	—3,029	—2.1	4.1
64. Paterson, N.J.	139,656	138,513	1,143	0.8	1.9
65. Albany, N.Y.	130,577	127,412	3,165	2.5	12.4
66. Chattanooga, Tenn.	128,163	119,798	8,365	7.0	106.9
67. Trenton, N.J.	124,697	123,356	1,341	1.1	3.4
68. Spokane, Wash.	122,001	115,514	6,487	5.6	10.6
69. Kansas City, Kan.	121,458	121,857	—399	—0.3	20.4
70. Fort Wayne, Ind.	118,410	114,946	3,464	3.0	32.8
71. Camden, N.J.	117,536	118,700	—1,164	—1.0	2.1
72. Erie, Pa.	116,955	115,967	988	0.9	24.2
73. Fall River, Mass.	115,428	115,274	154	0.1	—4.3
74. Wichita, Kan.	114,966	111,110	3,856	3.5	53.9
75. Wilmington, Del.	112,504	106,597	5,907	5.5	—3.2
76. Gary, Ind.	111,719	100,426	11,293	11.2	81.3
77. Knoxville, Tenn.	111,580	105,802	5,778	5.5	36.0
78. Cambridge, Mass.	110,879	113,643	—2,764	—2.4	3.6
79. Reading, Pa.	110,568	111,171	—603	—0.5	3.1
80. New Bedford, Mass.	110,341	112,597	—2,256	—2.0	—7.1
81. Elizabeth, N.J.	109,912	114,589	—4,677	—4.1	19.6
82. Tacoma, Wash.	109,408	106,817	2,591	2.4	10.2
83. Canton, Ohio	108,401	104,906	3,495	3.3	20.5
84. Tampa, Fla.	108,391	101,161	7,230	7.1	96.0
85. Sacramento, Calif.	105,958	93,750	12,208	13.0	42.2
86. Peoria, Ill.	105,087	104,969	118	0.1	37.9
87. Somerville, Mass.	102,177	103,908	—1,731	—1.7	11.6
88. Lowell, Mass.	101,389	100,234	1,155	1.2	—11.1
89. South Bend, Ind.	101,268	104,193	—2,925	—2.8	46.8
90. Duluth, Minn.	101,065	101,463	—398	—0.4	2.6
91. Charlotte, N.C.	100,899	82,675	18,224	22.0	78.4
92. Utica, N.Y.	100,518	101,740	—1,222	—1.2	8.1

*Less than 0.1%.

Farm Population.—The farm population, as it has been shown in the population census reports, comprises all persons living on farms, without regard to occupation. Since only about 1% of the entire farm population is found in urban areas, the statistics of the urban-farm population have been limited to a simple count of its number. The rural-farm population (comprising about 99% of the total farm population) has been set up, however, as a subdivision of the rural total and statistics are shown under most of the census classifications for three groups based on residence, namely, urban, rural-nonfarm and rural-farm. The statistics for these three groups, and also for the total farm population and the urban-farm population, are summarized for the last three censuses in Table VII.

Table VII.—*Farm Population, Rural-Nonfarm, and Rural-Farm: 1920 to 1940*
(The 1940 farm-nonfarm classification is based on a 5% sample of the census returns)

Item	1940	1930	1920	Per cent of increase	
				1930–40	1920–30
Total population	131,669,275	122,775,046	105,710,620	7.2	16.1
Rural population	57,245,573	53,820,223	51,406,017	6.4	4.7
Per cent of total	43.5	43.8	48.6	..	..
Rural-nonfarm population	27,094,497	23,662,710	20,047,377	14.5	18.0
Per cent of total	20.6	19.3	19.0	..	..
Per cent of rural	47.3	44.0	39.0	..	..
Rural-farm population	30,151,076	30,157,513	31,358,640	*	−3.8
Per cent of total	22.9	24.6	29.7	..	..
Per cent of rural	52.7	56.0	61.0	..	..
Total farm population	30,475,206	30,445,350	31,614,269	..	−3.7
Rural-farm	30,151,076	30,157,513	31,358,640	*	−3.8
Urban-farm	324,130	287,837	255,629	..	12.6

*Decrease of less than 0.1%.

The total farm population in 1940 was 30,475,206, representing a slight increase over the 1930 figure, which was 30,445,350. During the same period there was a decrease of about 3% in the number of farms, so that the average number of persons per farm may be assumed to have increased a little.

The urban-farm population consists rather largely of persons living on farms situated in the urban towns of New England and in other urban places where the incorporated area includes considerable areas of undeveloped land. While the figure involved is too small to be of great significance, it may be noted that the entire increase in farm population is the result of increase in this urban-farm group, since the rural-farm population shows a slight decrease. This means that all of the increase in the rural population between 1930 and 1940 was due to the growth of the rural-nonfarm group (made up of persons living in unincorporated towns, incorporated places of less than 2,500, and in nonfarm areas in the open country), which increased 14.5% between 1930 and 1940.

Sex Distribution.—The sex ratio (the number of males per 100 females) had fallen to 101.1 in 1940, as compared with 102.5 in 1930 and appreciably higher figures in most of the earlier censuses. In absolute figures, the number of males exceeded the number of females in 1940 by 697,051, as compared with an excess of 1,499,114 in 1930 and a maximum of 2,692,288 in 1910. The population data classified by sex are shown in Table VIII.

Table VIII.—*Population of the United States by Sex: 1820 to 1940*

Census year	Total	Male	Female	Males per 100 females	Excess of males
1940	131,669,275	66,183,163	65,486,112	101.1	697,051
1930	122,775,046	62,137,080	60,637,966	102.5	1,499,114
1920	105,710,620	53,900,431	51,810,189	104.0	2,090,242
1910	91,972,266	47,332,277	44,639,989	106.0	2,692,288
1900	75,994,575	38,816,448	37,178,127	104.4	1,638,321
1890	62,947,714	32,237,101	30,710,613	105.0	1,526,488
1880	50,155,783	25,518,820	24,636,963	103.6	881,857
1870	38,558,371	19,493,565	19,064,806	102.2	428,759
1860	31,443,321	16,085,204	15,358,117	104.7	727,087
1850	23,191,876	11,837,660	11,354,216	104.3	483,444
1840	17,069,453	8,688,532	8,380,921	103.7	307,611
1830	12,866,020	6,532,489	6,333,531	103.1	198,958
1820	9,638,453	4,896,605	4,741,848	103.3	154,757

The excess of males in the population of the United States has been due mainly to two factors: first, to the very considerable excess of males over females in the immigration from foreign countries; and second, to the fact that from 105 to 106 male infants are born for every 100 female. The effect of this last differential gradually disappears with increasing age, since the death rate among males is appreciably higher. The general decline in the sex ratio is, therefore, partly explained by the aging of the population and partly by the decrease in the extent of immigration, while the increase shown for certain census dates, notably 1910, is the result of periods of extensive immigration.

The sex distribution differs materially as between the urban population and the two rural groups, as indicated by the figures in Table IX. In 1940 the sex ratio in the urban population was 95.8, in the rural-nonfarm 104.2, and in the rural-farm 112.1, the urban and rural-nonfarm figures being appreciably lower than in 1930 and the rural-farm somewhat higher.

Table IX.—*Urban, Rural-Farm, and Rural-Nonfarm Population of the United States, by Sex: 1940 and 1930*
(The 1940 figures are based on a 5% sample of the census returns)

	Number			Per cent			Males per 100 females
	Total	Male	Female	Total	Male	Female	
1940							
United States	131,669,275	66,183,163	65,486,112	100.0	100.0	100.0	101.1
Urban	74,423,702	36,420,441	38,003,261	56.5	55.0	58.0	95.8
Rural-nonfarm	27,094,497	13,826,279	13,268,218	20.6	20.9	20.3	104.2
Rural-farm	30,151,076	15,936,443	14,214,633	22.9	24.1	21.7	112.1
1930							
United States	122,775,046	62,137,080	60,637,966	100.0	100.0	100.0	102.5
Urban	68,954,823	34,154,760	34,800,063	56.2	55.0	57.4	98.1
Rural-nonfarm	23,662,710	12,117,945	11,544,765	19.3	19.5	19.0	105.0
Rural-farm	30,157,513	15,864,375	14,293,138	24.6	25.5	23.6	111.0

One of the main reasons why the number of males per 100 females in the farm population is so much higher than in the urban is that the farms provide employment for large numbers of men but relatively few women, for which reason the young women from the farm areas migrate to the cities, where they find employment in the factories and in clerical occupations. The same relationship appears in the figures indicating the percentage distribution of the male and female population, respectively, among the urban-rural groups—58.0% of the females being urban, as compared with 55.0% of the males.

Age Composition.—The average age of U.S. population is steadily increasing. In 1940 the median age for the entire population, all classes and both sexes combined, was 28.9 years. (The median age is that age which divides the population into two equal groups, one-half being older and one-half younger, than the median.) The median age for 1930 was 26.4 years, and for 1820, the earliest date for which an age distribution for the entire population is available, it was 16.7 years. The average age of the population has thus been rising steadily during the course of U.S. history.

Table X.—*Population of the United States by Age: 1940 and 1930*
(The 1940 figures are based on a 5% sample of the census returns)

Age (years)	Number		Per cent distribution	
	1940	1930	1940	1930
All ages	131,669,275	*122,775,046	100.0	100.0
Under 5	10,597,891	11,444,390	8.0	9.3
5–9	10,725,873	12,007,609	8.1	10.3
10–13	9,373,315	9,622,492	7.1	7.8
14–19	14,764,100	13,934,500	11.2	11.3
20–24	11,561,533	10,870,378	8.8	8.9
25–44	39,743,302	36,152,869	30.2	29.4
45–64	25,947,055	21,414,981	19.7	17.4
65 and over	8,956,206	6,633,805	6.8	5.4

*Includes 94,022 persons of unknown age.

The age distribution of the population in 1940 and 1930 is given in Table X, while Table XI summarizes the figures into cumulative groups.

Table XI.—*Population of the United States in Cumulative Age Groups: 1940 and 1930*

(The 1940 figures are based on a 5% sample of the census returns)

Age	Number		Per cent	
	1940	1930	1940	1930
Total	131,669,275	122,775,046	100.0	100.0
Under 5 years	10,597,891	11,444,390	8.0	9.3
Under 10 years	21,323,764	24,051,999	16.2	19.6
Under 14 years	30,697,079	33,674,491	23.3	27.4
Under 20 years	45,461,179	47,608,991	34.5	38.8
Under 25 years	57,022,712	58,479,369	43.3	47.6
Over 25 years	74,646,563	64,201,655	56.7	52.3
Over 45 years	34,903,261	28,048,786	26.5	22.8
Over 65 years	8,956,206	6,633,805	6.8	5.4

A notable effect of this "aging" of the population has been the great increase in the number of elderly persons since 1930. In 1940 there were 8,956,206 persons 65 years old or over, an increase of 35% over the 6,633,805 reported in 1930. In 1940 34·5% of the population was under 20 years of age, 39·0% was 20 to 44 years of age, 19·7% was 45 to 64 years of age, and 6·8% was 65 years of age and over. In 1930 the younger age groups were relatively more populous—38·8% were under 20, 38·3% were between 20 and 44, 17·4% were 45 to 64 and only 5·4% were 65 or over.

The increasing numerical importance of the age group 65 years and over in the population can be seen most readily by computing the number of persons 65 years of age and over per 100 persons between the ages of 20 and 64. In 1930 there were only 10 such elderly persons to every 100 in the younger age group; in 1940 there were 12.

Colour Classification.—The proportions of whites and nonwhites remained substantially unchanged between the last two censuses; 89·8% of the population was classified as white (including Mexicans) and 10·2% was returned as nonwhite.

The white population as a whole increased 7·2% between 1930 and 1940, and the nonwhite population increased 7·7%. When these two classes are analyzed by urban and rural residence, however, marked differences in the pattern of growth become apparent. Whereas the urban white population increased 6·9%, the urban nonwhite population increased 19·6%, or nearly one-fifth. The rural white population as a whole increased 7·5%, but the rural nonwhite population actually decreased by 1·3%. In rural-nonfarm areas the white population increased by 15·5%, but the nonwhite population had a growth of only 4·8%. In farm areas the white population increased very slightly (0·7%), and the coloured (nonwhite) showed a 3·9% decrease.

Employment Status.—Provision was made in the 1940 census for classifying all persons 14 years old and over according to their status in the labour force, or their relation to the labour force, during the week of March 24–30, 1940, this representing a considerable change from the practice in earlier censuses, in which all persons who reported that they usually followed a gainful occupation were counted as gainful workers. A summary of this classification, based on a preliminary tabulation of a 5% cross-section of the census returns, is presented in Table XII.

According to these figures there were 100,972,196 persons 14 years old and over, of whom 52,840,762 were in the labour force. The labour force included three main groups: 45,350,430 persons who were at work on private or nonemergency government work, or who had jobs from which they were temporarily absent; 2,380,062 persons who were on public emergency projects (WPA, NYA, CCC, etc.); and 5,110,270 who were seeking work and who were without any form of public or private employment. Because of difficulties peculiar to the enumeration of public emergency workers, the employment status of a considerable number of such workers was improperly classified. The emergency agencies reported a total of approximately 2,906,000 persons on their rolls at about the time of the census week, not including 472,000 persons on the NYA student work program.

The percentage distribution of the persons in the labour force among the various categories shown in the classification is given in Table XIII.

Table XIII.—*Per Cent Distribution by Employment Status of Persons 14 Years of Age and Over in the Labour Force, by Sex, for the United States: March 24-30, 1940*

(Figures are based on a preliminary tabulation of a 5% sample of the census returns)

Employment status	Total	Male	Female
Total in the labour force	100.0	100.0	100.0
Employed (except on public emergency work)	85.8	85.5	86.8
At work	83.4	83.1	84.1
With a job	2.5	2.4	2.7
On public emergency work (WPA, NYA and CCC)	4.5	4.9	3.4
Seeking work	9.7	9.6	9.9
Experienced workers	8.2	8.4	7.4
New workers	1.5	1.2	2.4

The 48,131,434 persons not in the labour force represented 47·7% of the total population 14 years old and over and included 28,838,484 persons engaged in home housework, 9,070,986 persons attending school, 5,220,098 persons unable to work, 1,226,374 inmates of institutions, 1,986,348 persons not working or seeking work for other reasons, and 1,789,144 persons whose employment status during the census week could not be determined. Preliminary data on the sex, age and residence of these persons indicate

Table XII.—*Employment Status of Persons 14 Years of Age and Over, by Sex, in the United States: March 24-30, 1940*

(Figures are based on a preliminary tabulation of a 5% sample of the census returns)

Employment status	Total	Male	Female	Per cent distribution		
				Total	Male	Female
Total population	131,669,275	66,183,163	65,486,112	....	....	....
Persons 14 years of age and over	100,972,196	50,614,304	50,357,892	100.0	100.0	100.0
In the labour force	52,840,762	39,994,197	12,846,565	52.3	79.0	25.5
Employed (except on public emergency work)	45,350,430	34,201,490	11,148,940	44.9	67.6	22.1
At work[1]	44,049,743	33,250,189	10,799,554	43.6	65.7	21.4
With a job[2]	1,300,687	951,301	349,386	1.3	1.9	0.7
On public emergency work (WPA, NYA and CCC)[3]	2,380,062	1,947,975	432,087	2.4	3.8	0.9
Seeking work[4]	5,110,270	3,844,732	1,265,538	5.1	7.6	2.5
Experienced workers	4,313,575	3,362,671	950,904	4.3	6.6	1.9
New workers[5]	796,695	482,061	314,634	0.8	1.0	0.6
Not in the labour force	48,131,434	10,620,107	37,511,327	47.7	21.0	74.5
Engaged in home housework	28,838,484	286,804	28,551,680	28.6	0.6	56.7
In school	9,070,986	4,615,015	4,455,971	9.0	9.1	8.8
Unable to work	5,220,098	2,953,658	2,266,440	5.2	5.8	4.5
In institutions[6]	1,226,374	795,616	430,758	1.2	1.6	0.9
Other	1,986,348	1,211,330	775,018	2.0	2.4	1.5
Unknown[7]	1,789,144	757,684	1,031,460	1.8	1.5	2.0

[1]Persons who worked for pay or profit (except on public emergency work), or assisted without pay in a family enterprise, at any time during the week of March 24–30, 1940.

[2]Persons who had jobs (except on public emergency work), businesses or professional enterprises at which they did not work during the week of March 24–30, 1940, because of temporary illness, vacation, industrial dispute, bad weather or layoff not exceeding 4 weeks with instructions to return by a specific date.

[3]The number of persons reported in the census as on public emergency work was considerably below the number indicated by the records of the various emergency work agencies. It is probable that the majority of such workers who were not properly classified were returned as employed on private or nonemergency government work.

[4]Persons not at private or nonemergency government work, nor on public emergency work, who were seeking work during the week of March 24–30, 1940.

[5]Persons seeking work who had not previously worked full time for one month or more at a single job.

[6]Inmates of penal institutions, hospitals for the mentally diseased or defective, and homes for the aged, infirm and needy.

[7]Includes some persons whose activity during the week of March 24–30, 1940, could not be definitely determined. It is believed that the majority of these were not in the labour force.

that the great majority were probably not in the labour force.

The proportions of the total labour force seeking work and without any form of public or private employment varied somewhat in different segments of the population. The proportions were roughly similar for men and women, being 9·6% and 9·9%, respectively. The proportion seeking work in the white population was 9·5%, as compared with 10·9% for the nonwhite. Differences were especially large in terms of age. Of the 5,110,270 persons seeking work, about two-fifths were youths from 14 to 24 years of age, although this age group comprised but slightly more than one-fifth of the total labour force. These figures do not include persons on public emergency work, who are usually counted as part of the unemployed, and hence provide only an approximation of the differentials in unemployment rates.

The proportion of the population 14 years old and over in the labour force varied considerably by sex, age, colour and as between urban and rural areas, as indicated by the figures in Table XIV. The proportions of males and females 14 years old and over in the labour force were 79·0% and 25·5%, respectively. For both sexes the proportion in the labour force was low in the age group 14–19 years; it was considerably higher in the next two age groups (20–24 years and 25–44 years) and was somewhat lower for persons in the 45–64 year group. The proportion in the labour force was lowest for persons 65 years old and over. Colour differences were significant in that 51·7% of all white persons and 58·4% of all nonwhite persons 14 years old and over were in the labour force; the difference was due largely to the much higher proportion of nonwhite females who were workers. There was no age class in which the majority of women 14 years old and over were in the labour force. However, the great majority of men from 20 to 64 years of age were in the labour force. The labour force represented 54·7% of all persons over 14 years of age in urban areas, as compared with 48·4% in rural-nonfarm and 49·4% in rural-farm areas.

The labour-force concept underlying the 1940 data on employment and unemployment is not strictly comparable with the gainful-worker concept of previous censuses. The 1940 definition was based on the activity of the person during a given week while the 1930 figure for "gainful workers" included all those persons usually following a gainful occupation, regardless of whether they were working or seeking work at the time of the census. It is possible that certain classes of persons, such as retired workers, some inmates of institutions, recently incapacitated workers, and seasonal workers neither working nor seeking work at the time of the census, were frequently included among gainful workers in 1930, but, in general, not in the 1940 labour force. On the other hand, the 1940 census included in the labour force persons seeking work without previous work experience, that is, new workers, few of whom were included in the 1930 gainful-worker group.

Table XV.—*Number of Dwelling Units, Occupied and Vacant, in Urban and Rural Areas of the United States: 1940, with 1930 Family Data*

Item	Total	In urban places		In rural territory
		Number	Per cent of total	
1940*				
All dwelling units	37,336,890	21,621,985	57.9	15,714,905
Occupied dwelling units	34,861,625	20,598,506	59.1	14,263,119
Vacant, for sale or rent	1,884,016	923,235	49.0	960,781
Per cent of all dwelling units	5.0	4.3	..	6.1
Vacant, not for sale or rent†	591,249	100,244	17.0	491,005
Total population	131,669,275	74,423,702	56.5	57,245,573
Average population per occupied dwelling unit	3.8	3.6	..	4.0
1930				
Total population	122,775,046	68,954,823	56.2	53,820,223
Private families	29,904,663	17,372,524	58.1	12,532,139
Average population per private family	4.1	4.0	..	4.3

*Semifinal figures, subject to possible slight change.
†Mainly vacant dwelling units (largely seasonal) held for absent households, together with a few dwelling units occupied by nonresident households.

Housing Data.—The census of housing was taken at the same time as the census of population and by the same enumerators who obtained information on both the population schedule and the housing schedule at the same visit to each place of residence. The main purpose of the housing inquiries was to obtain detailed information about the living quarters occupied by the population of the United States. From the housing census were obtained also a number of fundamentally important items which have previously been obtained on the population schedule, such as tenure and value or rent of home, and size of family or household. The two schedules, population and housing, are being tabulated in close conjunction, with correlation of items from both in several of the tabulations. Certain new designations have been made necessary by the added detail called for in this census. A dwelling unit, as the term is here used, is the living quarters occupied by one family or household. In an apartment house there are, therefore, as many dwelling units as there are separate apartments.

The more significant of the available housing items are summarized in Table XV, which gives the figures for urban and rural areas as well as for the United States as a whole, together with some significant data for 1930.

Of the 37,336,890 dwelling units reported in the entire country, 1,884,016, or 5·0%, were returned as vacant and for sale or rent; while 591,249 were returned as vacant (or at least not occupied by regularly enumerated census families) and not for sale or rent. This last group was made up rather largely of seasonal dwelling units, such as summer homes held for later occupancy by households not living in them at the time of the census.

The percentage of dwelling units vacant and on the market in urban areas was only 4·3, as compared with 6·1 in rural areas. The dwelling units reported include both seasonal and ordinary units, and the larger percentage vacant in rural territory is explained in part by the large number of seasonal units in rural areas.

The number of occupied dwelling units represents approximately the number of private households in the respective areas and may therefore be compared roughly with the number of private families shown in the census reports for 1930. Such a comparison shows

Table XIV.—*Persons 14 Years of Age and Over in the Labour Force in the U.S. by Sex and Colour, by Sex and Age, and by Sex for Urban and Rural Areas: 1940*

(Figures are based on a preliminary tabulation of a 5% sample of the census returns)

Colour, age and area	Population 14 years of age and over			Persons in the labour force					
				Number			Per cent of population 14 and over		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total	100,972,196	50,614,304	50,357,892	52,840,762	39,994,197	12,846,565	52.3	79.0	25.5
White	91,312,407	45,876,539	45,435,868	47,203,715	36,206,758	10,996,957	51.7	78.9	24.2
Nonwhite	9,659,789	4,737,765	4,922,024	5,637,047	3,787,439	1,849,608	58.4	79.9	37.6
Age:									
14–19 years	14,764,100	7,411,372	7,352,728	3,956,550	2,571,181	1,385,369	26.8	34.7	18.8
20–24 years	11,561,533	5,664,502	5,897,031	7,675,415	4,997,233	2,678,182	66.4	88.2	45.4
25–44 years	39,743,302	19,808,976	19,934,326	24,784,987	18,749,757	6,035,230	62.4	94.7	30.3
45–64 years	25,947,055	13,342,337	12,604,718	14,334,760	11,845,610	2,489,150	55.2	88.8	19.7
65 and over	8,956,206	4,387,117	4,569,089	2,089,050	1,830,416	258,634	23.3	41.7	5.7
Urban-rural:									
Urban	59,610,637	28,939,325	30,671,312	32,613,234	23,049,730	9,563,504	54.7	79.6	31.2
Rural-nonfarm	20,068,895	10,252,689	9,816,206	9,719,014	7,694,199	2,024,815	48.4	75.0	20.6
Rural-farm	21,292,664	11,422,290	9,870,374	10,508,514	9,250,268	1,258,246	49.4	81.0	12.7

that the number of private households increased approximately 16·6%. This increase is considerably more than the 7·2% increase shown in population in the United States between 1930 and 1940. The average population per occupied dwelling unit in 1940 was 3·8 for the United States as a whole, as compared with an average population per family of 4·1 in 1930. More than half of the increase in number of families in the decade is thus due to a decline in family size and less than half to population increase.

The decline in the average population per family from 4·1 in 1930 to 3·8 in 1940 indicates the continuation, at an accelerated rate, of the downward trend in family size which is shown by the following averages from earlier censuses: 4·9 in 1890, 4·7 in 1900, 4·5 in 1910 and 4·3 in 1920. The average population per family, which had been decreasing at the rate of two-tenths of a person per decade since 1890, as indicated by these figures, decreased three-tenths of a person, or half as much again, between 1930 and 1940; or, making the comparison directly with 1890, the average population per family in 1940 is less by 1·1 persons than it was 50 years ago. The decline in the average size of the family in the United States is due primarily to increased urbanization and the decline in the birth rate.

Table XVI.—*Data Indicating Number and Size of U.S. Families: 1940 and 1930*

Division and state	Occupied dwelling units, 1940*	Private families, 1930	Average population per unit†	
			1940	1930
United States	34,861,625	29,904,663	3.8	4.1
Geographic divisions:				
New England	2,201,647	1,981,499	3.8	4.1
Middle Atlantic	7,279,087	6,374,380	3.8	4.1
East north central	7,276,297	6,362,823	3.7	4.0
West north central	3,689,070	3,317,881	3.7	4.0
South Atlantic	4,279,740	3,511,860	4.2	4.5
East south central	2,622,810	2,273,359	4.1	4.3
West south central	3,377,534	2,868,262	3.9	4.2
Mountain	1,120,694	914,408	3.7	4.0
Pacific	3,014,746	2,300,191	3.2	3.6
New England:				
Maine	218,999	197,826	3.9	4.0
New Hampshire	133,010	119,337	3.7	3.9
Vermont	92,432	89,188	3.9	4.0
Massachusetts	1,120,524	1,021,160	3.9	4.2
Rhode Island	187,795	165,343	3.8	4.2
Connecticut	448,887	388,645	3.8	4.1
Middle Atlantic:				
New York	3,662,618	3,153,124	3.7	4.0
New Jersey	1,100,585	985,636	3.8	4.1
Pennsylvania	2,515,884	2,235,620	3.9	4.3
East north central:				
Ohio	1,898,212	1,697,918	3.6	3.9
Indiana	961,500	843,066	3.6	3.8
Illinois	2,193,114	1,929,396	3.6	4.0
Michigan	1,396,206	1,180,554	3.8	4.1
Wisconsin	827,265	711,889	3.8	4.1
West north central:				
Minnesota	728,513	606,496	3.8	4.2
Iowa	701,920	635,704	3.6	3.9
Missouri	1,068,811	939,476	3.5	3.9
North Dakota	152,171	145,005	4.2	4.7
South Dakota	165,430	161,013	3.9	4.3
Nebraska	360,811	342,999	3.6	4.0
Kansas	511,414	487,188	3.5	3.9
South Atlantic:				
Delaware	70,572	59,092	3.8	4.0
Maryland	466,002	385,179	3.9	4.2
District of Columbia	173,709	125,554	3.8	3.9
Virginia	627,659	529,089	4.3	4.6
West Virginia	444,889	373,941	4.3	4.6
North Carolina	789,566	644,033	4.5	4.9
South Carolina	434,922	365,680	4.4	4.8
Georgia	752,286	652,793	4.2	4.5
Florida	520,135	376,499	3.6	3.9
East south central:				
Kentucky	698,604	609,405	4.1	4.3
Tennessee	715,425	600,625	4.1	4.4
Alabama	673,914	591,625	4.2	4.5
Mississippi	534,867	471,704	4.1	4.3
West south central:				
Arkansas	495,841	438,639	3.9	4.2
Louisiana	592,595	485,363	4.0	4.3
Oklahoma	610,424	564,164	3.8	4.2
Texas	1,678,674	1,380,096	3.8	4.2
Mountain:				
Montana	159,977	136,210	3.5	3.9
Idaho	141,765	108,044	3.7	4.1
Wyoming	69,357	56,887	3.6	4.0
Colorado	316,112	267,324	3.6	3.9
New Mexico	129,504	98,546	4.1	4.3
Arizona	131,189	105,992	3.8	4.1
Utah	139,496	115,936	3.9	4.4
Nevada	33,294	25,469	3.3	3.6
Pacific:				
Washington	537,968	423,833	3.2	3.7
Oregon	337,731	266,328	3.2	3.6
California	2,139,047	1,610,030	3.2	3.5

*Semifinal figures, subject to possible slight change.
†Average population per occupied dwelling unit for 1940; average population per private family for 1930. These two averages are roughly equivalent and comparable.

Present and Proposed Congressional Apportionments as Determined by the Census of 1940, Using the Method of Major Fractions
(to be effective in the congress of 1943)

State	Present	New	State	Present	New
Alabama	9	9	Nebraska	5	4
Arizona	1	2	Nevada	1	1
Arkansas	7	6	New Hampshire	2	2
California	20	23	New Jersey	14	14
Colorado	4	4	New Mexico	1	2
Connecticut	6	6	New York	45	45
Delaware	1	1	North Carolina	11	12
Florida	5	6	North Dakota	2	2
Georgia	10	10	Ohio	24	23
Idaho	2	2	Oklahoma	9	8
Illinois	27	26	Oregon	3	4
Indiana	12	11	Pennsylvania	34	33
Iowa	9	8	Rhode Island	2	2
Kansas	7	6	South Carolina	6	6
Kentucky	9	9	South Dakota	2	2
Louisiana	8	8	Tennessee	9	10
Maine	3	3	Texas	21	21
Maryland	6	6	Utah	2	2
Massachusetts	15	14	Vermont	1	1
Michigan	17	18	Virginia	9	9
Minnesota	9	9	Washington	6	6
Mississippi	7	7	West Virginia	6	6
Missouri	13	13	Wisconsin	10	10
Montana	2	2	Wyoming	1	1

The data relative to size of family for 1940 and 1930 are presented by states in Table XVI.

Among the geographic divisions, the average 1940 population per occupied dwelling unit ranged from 3·2 in the Pacific division to 4·2 in the South Atlantic division. In only two divisions was the average four persons or more in 1940, whereas all but one division had averages of four persons or more in 1930.

Among the states, the range in the average population per occupied dwelling unit was from 3·2 in Washington, Oregon and California, to 4·5 in North Carolina. Eleven other states, nine of them in the south, had averages of four persons or more, while no state outside the far west showed an average less than 3·5.

The decrease in the average population per family was shared rather uniformly by all of the states, the difference in most cases being either three-tenths or four-tenths of a unit.

1940 Census Reports.—The 1940 count of total population was (Feb. 1941) available either in printed form or in processed releases, for all states, counties, cities, towns, villages (incorporated), and other political subdivisions of the country, and the counts of housing units are likewise available for states, counties and incorporated places of 2,500 or more. Data were available from the preliminary tabulation of the 5% sample on the following subjects: employment status; sex, colour, age and farm-nonfarm residence. The simpler tabulations of this series provide figures for states and large cities, and the more complex cross-tabulations, for the United States as a whole or for large subdivisions.

Complete tabulations for population and housing units, classified in accordance with the more important characteristics (and available for small areas), were to be made public, state by state, through the summer of 1941, with many series completed by early fall. The volume summarizing the population counts was scheduled to be issued in the summer of 1941, but other volumes of the final reports would probably not be forthcoming much before the end of 1941. (*See* also MUNICIPAL GOVERNMENT.) (L. E. T.)

Table XVII.—*Population of Cities and Other Urban Places of 5,000 or More, by States: 1940 and 1930*

Place	1940	1930	Place	1940	1930
ALABAMA:			ALABAMA—Con.:		
Alexander City	6,640	4,519	Cullman	5,074	2,786
Andalusia	6,886	5,154	Decatur	16,604	15,593
Anniston	25,523	22,345	Dothan	17,194	16,046
Bessemer	22,826	20,721	Eufaula	6,269	5,208
Birmingham	267,583	259,678	Fairfield	11,703	11,059

Place	1940	1930
ALABAMA—Con.:		
Florence	15,043	11,729
Gadsden	36,975	24,042
Greenville	5,075	3,985
Homewood	7,397	6,103
Huntsville	13,050	11,554
Jasper	6,847	5,313
Lanett	6,141	5,204
Mobile	78,720	68,202
Montgomery	78,084	66,079
Opelika	8,487	6,156
Phenix City	15,351	13,862
Prichard	6,084	4,580
Selma	19,834	18,012
Sheffield	7,933	6,221
Sylacauga	6,269	4,115
Talladega	9,298	7,596
Tarrant City	6,833	7,341
Troy	7,055	6,814
Tuscaloosa	27,493	20,659
Tuscumbia	5,515	4,533
ARIZONA:		
Bisbee	5,853	8,023
Douglas	8,623	9,828
Flagstaff	5,080	3,891
Globe	6,141	7,157
Mesa	7,224	3,711
Nogales	5,135	6,006
Phoenix	65,414	48,118
Prescott	6,018	5,517
Tucson	36,818	32,506
Yuma	5,325	4,892
ARKANSAS:		
Arkadelphia	5,078	3,380
Batesville	5,267	4,484
Blytheville	10,652	10,098
Camden	8,975	7,273
Conway	5,782	5,534
El Dorado	15,858	16,421
Fayetteville	8,212	7,394
Forrest City	5,699	4,594
Fort Smith	36,584	31,429
Helena	8,546	8,316
Hope	7,475	6,008
Hot Springs	21,370	20,238
Jonesboro	11,729	10,326
Little Rock	88,039	81,679
Malvern	5,290	5,115
North Little Rock	21,137	19,418
Paragould	7,079	5,966
Pine Bluff	21,290	20,760
Russellville	5,927	5,628
Stuttgart	5,628	4,927
Texarkana[1]	11,821	10,764
Van Buren	5,422	5,182
CALIFORNIA:		
Alameda	36,256	35,033
Albany	11,493	8,569
Alhambra	38,935	29,472
Anaheim	11,031	10,995
Antioch	5,106	3,563
Arcadia	9,122	5,216
Azusa	5,209	4,808
Bakersfield	29,252	26,015
Bell	11,264	7,884
Belvedere township[2]	37,192	33,023
Berkeley	85,547	82,109
Beverly Hills	26,823	17,429
Brawley	11,718	10,439
Burbank	34,337	16,662
Burlingame	15,940	13,270
Calexico	5,415	6,299
Chico	9,287	7,961
Chula Vista	5,138	3,869
Coalinga	5,026	2,851
Colton	9,686	8,014
Compton	16,198	12,516
Corona	8,764	7,018
Coronado	6,932	5,425
Culver City	8,976	5,669
Daly City	9,625	7,838
El Centro	10,017	8,434
El Cerrito	6,137	3,870
Eureka	17,055	15,752
Fresno	60,685	52,513
Fullerton	10,442	10,860
Gardena[3]	5,909	..
Glendale	82,582	62,736
Grass Valley	5,701	3,817
Hanford	8,234	7,028
Hawthorne	8,263	6,596
Hayward	6,736	5,530
Hermosa Beach	7,197	4,796
Huntington Park	28,648	24,591
Inglewood	30,114	19,480
Lodi	11,079	6,788
Long Beach	164,271	142,032
Los Angeles	1,504,277	1,238,048
Lynwood	10,982	7,323
Madera	6,457	4,665
Manhattan Beach	6,398	1,891
Martinez	7,381	6,569
Marysville	6,646	5,763
Maywood	10,731	6,794
Merced	10,135	7,066
Modesto	16,379	13,842
Monrovia	12,807	10,890
Montebello	8,016	5,498
CALIFORNIA—Con.:		
Monterey	10,084	9,141
Monterey Park	8,531	6,406
Napa	7,740	6,437
National City	10,344	7,301
Oakland	302,163	284,063
Ontario	14,197	13,583
Orange	7,901	8,066
Oxnard	8,519	6,285
Pacific Grove	6,249	5,558
Palo Alto	16,774	13,652
Pasadena	81,864	76,086
Petaluma	8,034	8,245
Piedmont	9,866	9,333
Pittsburg	9,520	9,610
Pomona	23,539	20,804
Porterville	6,270	5,303
Redding	8,109	4,188
Redlands	14,324	14,177
Redondo Beach	13,092	9,347
Redwood City	12,453	8,962
Richmond	23,642	20,093
Riverside	34,696	29,696
Roseville	6,653	6,425
Sacramento	105,958	93,750
Salinas	11,586	10,263
San Anselmo	5,790	4,650
San Bernardino	43,646	37,481
San Bruno	6,519	3,610
San Buenaventura (Ventura)	13,264	11,603
San Diego	203,341	147,995
San Fernando	9,994	7,567
San Francisco	634,536	634,394
San Gabriel	11,867	7,224
San Jose	68,457	57,651
San Leandro	14,601	11,455
San Luis Obispo	8,881	8,276
San Marino	8,175	3,730
San Mateo	19,403	13,444
San Rafael	8,573	8,022
Santa Ana	31,921	30,322
Santa Barbara	34,958	33,613
Santa Clara	6,650	6,302
Santa Cruz	16,896	14,395
Santa Maria	8,522	7,057
Santa Monica	53,500	37,146
Santa Paula	8,986	7,452
Santa Rosa	12,605	10,636
South Gate	26,945	19,632
South Pasadena	14,356	13,730
South San Francisco	6,629	6,193
Stockton	54,714	47,963
Torrance	9,950	7,271
Tulare	8,259	6,207
Upland	6,316	4,713
Vallejo[4]	20,072	16,072
Visalia	8,904	7,263
Watsonville	8,937	8,344
Whittier	16,115	14,822
Woodland	6,637	5,542
COLORADO:		
Alamosa	5,613	5,107
Boulder	12,958	11,223
Canon City	6,690	5,938
Colorado Springs	36,789	33,237
Denver	322,412	287,861
Durango	5,887	5,400
Englewood	9,680	7,980
Fort Collins	12,251	11,489
Grand Junction	12,479	10,247
Greeley	15,995	12,203
La Junta	7,040	7,193
Longmont	7,406	6,029
Loveland	6,145	5,506
Pueblo	52,162	50,096
Sterling	7,411	7,195
Trinidad	13,223	11,732
Walsenburg	5,855	5,503
CONNECTICUT:		
Ansonia	19,210	19,898
Bridgeport	147,121	146,716
Bristol	30,167	28,451
Danbury	22,339	22,261
Derby	10,287	10,788
East Hartford town[2]	18,615	17,125
Hartford	166,267	164,072
Meriden	39,494	38,481
Middletown	26,495	24,554
Naugatuck	15,388	14,315
New Britain	68,685	68,128
New Haven	160,605	162,655
New London	30,456	29,640
Norwalk	39,849	36,019
Norwich	23,652	23,021
Putnam	7,775	7,318
Rockville	7,572	7,445
Shelton	10,971	10,113
Southington	5,088	5,125
Stamford	47,938	46,346
Stratford town[2]	22,580	19,212
Torrington	26,988	26,040
Wallingford	11,425	11,170
Waterbury	99,314	99,902
West Hartford town[2]	33,776	24,941
West Haven town[2]	30,021	25,808
CONNECTICUT—Con.:		
Willimantic	12,101	12,102
Winsted	7,674	7,883
DELAWARE:		
Dover	5,517	4,800
Wilmington	112,504	106,597
DISTRICT OF COLUMBIA:		
Washington	663,091	486,869
FLORIDA:		
Bartow	6,158	5,269
Bradenton	7,444	5,986
Clearwater	10,136	7,607
Coral Gables	8,294	5,097
Daytona Beach	22,584	16,598
De Land	7,041	5,246
Fort Lauderdale	17,996	8,666
Fort Myers	10,604	9,082
Fort Pierce	8,040	4,803
Gainesville	13,757	10,465
Hollywood	6,239	2,869
Jacksonville[5]	173,065	129,549
Key West	12,927	12,831
Lake City	5,836	4,416
Lakeland	22,068	18,554
Lake Wales	5,024	3,401
Lake Worth	7,408	5,940
Marianna	5,079	3,372
Miami	172,172	110,637
Miami Beach	28,012	6,494
Ocala	8,986	7,281
Orlando	36,736	27,330
Palatka	7,140	6,500
Panama City	11,610	5,402
Pensacola	37,449	31,579
Plant City	7,491	6,800
River Junction	7,110	5,624
St. Augustine	12,090	12,111
St. Petersburg	60,812	40,425
Sanford	10,217	10,100
Sarasota	11,141	8,398
Tallahassee	16,240	10,700
Tampa	108,391	101,161
West Palm Beach	33,693	26,610
Winter Haven	6,199	7,130
GEORGIA:		
Albany	19,055	14,507
Americus	9,281	8,760
Athens	20,650	18,192
Atlanta	302,288	270,366
Augusta	65,919	60,342
Bainbridge	6,352	6,141
Brunswick	15,035	14,022
Carrollton	6,214	5,052
Cartersville	6,141	5,250
Cedartown	9,025	8,124
College Park	8,213	6,604
Columbus	53,280	43,131
Cordele	7,929	6,880
Dalton	10,448	8,160
Decatur	16,561	13,276
District 1511, Center Hill[2]	12,155	8,460
Douglas	5,175	4,206
Dublin	7,814	6,681
East Point	12,403	9,512
Elberton	6,188	4,650
Fitzgerald	7,388	6,412
Gainesville	10,243	8,624
Griffin	13,222	10,321
Hapeville	5,959	4,224
La Grange	21,983	20,131
Macon	57,865	53,829
Marietta	8,667	7,638
Milledgeville	6,778	5,534
Moultrie	10,147	8,027
Newnan	7,182	6,386
Rome	26,282	21,843
Savannah	95,996	85,024
Statesboro	5,028	3,996
Thomaston	6,396	4,922
Thomasville	12,683	11,733
Tifton	5,228	3,390
Toccoa	5,494	4,602
Valdosta	15,595	13,482
Waycross	16,763	15,510
IDAHO:		
Boise City	26,130	21,544
Burley	5,329	3,826
Caldwell	7,272	4,974
Coeur d'Alene	10,049	8,297
Idaho Falls	15,024	9,429
Lewiston	10,548	9,403
Moscow	6,014	4,476
Nampa	12,149	8,206
Pocatello	18,133	16,471
Twin Falls	11,851	8,787
ILLINOIS:		
Alton	31,255	30,151
Arlington Heights	5,668	4,997
Aurora	47,170	46,589
Batavia	5,101	5,045
Beardstown	6,505	6,344
Belleville	28,405	28,425
ILLINOIS—Con.:		
Bellwood	5,220	4,991
Belvidere	8,094	8,123
Benton	7,372	8,219
Berwyn	48,451	47,027
Bloomington	32,868	30,930
Blue Island	16,638	16,534
Brookfield	10,817	10,035
Cairo	14,407	13,532
Calumet City	13,241	12,298
Canton	11,577	11,718
Carbondale	8,550	7,528
Centralia	16,343	12,583
Champaign	23,302	20,348
Charleston	8,197	8,012
Chester	5,110	3,922
Chicago	3,396,808	3,376,438
Chicago Heights	22,461	22,321
Cicero	64,712	66,602
Clinton	6,331	5,920
Collinsville	9,767	9,235
Danville	36,919	36,765
Decatur	59,305	57,510
De Kalb	9,146	8,545
Des Plaines	9,518	8,798
Dixon	10,671	9,008
Downers Grove	9,526	8,977
Du Quoin	7,515	7,593
East Moline	12,359	10,107
East Peoria	6,806	5,027
East St. Louis	75,609	74,347
Edwardsville	8,008	6,235
Effingham	6,180	4,978
Elgin	38,333	35,929
Elmhurst	15,458	14,055
Elmwood Park	13,689	11,270
Evanston[6]	65,389	63,120
Flora	5,474	4,393
Forest Park	14,840	14,555
Freeport	22,366	22,045
Galesburg	28,876	28,830
Glencoe	6,825	6,295
Glen Ellyn	8,055	7,680
Granite City	22,974	25,130
Harrisburg	11,453	11,625
Harvey	17,878	16,374
Herrin	9,352	9,708
Highland Park	14,476	12,203
Hinsdale	7,336	6,923
Hoopeston	5,381	5,613
Jacksonville	19,844	17,747
Johnston City	5,418	5,955
Joliet	42,365	42,993
Kankakee	22,241	20,620
Kewanee	16,901	17,093
La Grange	10,479	10,103
Lake Forest	6,885	6,554
La Salle	12,812	13,149
Lawrenceville	6,213	6,303
Lincoln	12,752	12,855
Litchfield	7,048	6,612
Lombard	7,075	6,197
Macomb	8,764	8,509
Madison	7,782	7,661
Marion	9,251	9,033
Mattoon	15,827	14,631
Maywood	26,648	25,829
Melrose Park	10,933	10,741
Metropolis	6,287	5,573
Moline	34,608	32,236
Monmouth	9,096	8,660
Morris	6,145	5,568
Mount Carmel	6,987	7,132
Mount Vernon	14,724	12,375
Murphysboro	8,976	8,182
Naperville	5,272	5,118
Niles Center	7,172	5,007
Normal	6,983	6,768
North Chicago	8,465	8,466
Oak Park	66,015	63,982
Olney	7,831	6,140
Ottawa	16,005	15,094
Pana	5,966	5,835
Paris	9,281	8,781
Park Ridge	12,063	10,417
Pekin	19,407	16,129
Peoria	105,087	104,969
Peru	8,983	9,121
Pontiac	9,585	8,272
Princeton	5,224	4,762
Quincy	40,469	39,241
River Forest	9,487	8,829
Riverside	7,935	6,770
Rockford	84,637	85,864
Rock Island	42,775	37,953
St. Charles	5,870	5,377
Salem	7,319	4,420
Springfield	75,503	71,864
Spring Valley	5,010	5,270
Sterling	11,363	10,012
Streator	14,930	14,728
Summit	7,943	6,548
Taylorville	8,313	7,316
Urbana	14,064	13,060
Vandalia	5,288	4,342
Venice	5,454	5,362
Villa Park	7,236	6,220
Waukegan	34,241	33,496
West Frankfort	12,383	14,683
Wheaton	7,389	7,258
Wilmette	17,226	15,238
Winnetka	12,430	12,160
Wood River	8,197	8,130

Footnotes at end of table.

Place	1940	1930
LLINOIS—Con.:		
Woodstock	6,123	5,471
ion	6,555	5,991
NDIANA:		
Anderson	41,572	39,804
Auburn	5,415	5,088
Bedford	12,514	13,208
Bicknell	5,110	5,212
Bloomington	20,870	18,227
Bluffton	5,417	5,074
Brazil	8,126	8,744
Clinton	7,092	7,936
Columbus	11,738	9,935
Connersville	12,898	12,795
Crawfordsville	11,089	10,355
Decatur	5,861	5,156
East Chicago	54,637	54,784
Elkhart	33,434	32,949
Elwood	10,913	10,685
Evansville	97,062	102,249
Fort Wayne	118,410	114,946
Frankfort	13,706	12,196
Franklin	6,264	5,682
Gary	111,719	100,426
Goshen	11,375	10,397
Greensburg	6,065	5,702
Hammond	70,184	64,560
Hartford City	6,946	6,613
Hobart	7,166	5,787
Huntington	13,903	13,420
Indianapolis	386,972	364,161
Jasper	5,041	3,905
Jeffersonville	11,493	11,946
Kendallville	5,431	5,439
Kokomo	33,795	32,843
Lafayette	28,798	26,240
La Porte	16,180	15,755
Lebanon	6,529	6,445
Linton	6,263	5,085
Logansport	20,177	18,508
Madison	6,923	6,530
Marion	26,767	24,496
Martinsville	5,009	4,962
Michigan City	26,476	26,735
Mishawaka	28,298	28,630
Mount Vernon	5,638	5,035
Muncie	49,720	46,548
New Albany	25,414	25,819
New Castle	16,620	14,027
Noblesville	5,575	4,811
Peru	12,432	12,730
Plymouth	5,713	5,290
Portland	6,362	5,276
Princeton	7,786	7,505
Richmond	35,147	32,493
Rushville	5,960	5,709
Seymour	8,620	7,508
Shelbyville	10,791	10,618
South Bend	101,268	104,193
Sullivan	5,077	5,306
Tell City	5,395	4,873
Terre Haute	62,693	62,810
Tipton	5,101	4,861
Valparaiso	8,736	8,079
Vincennes	18,228	17,564
Wabash	9,653	8,840
Warsaw	6,378	5,730
Washington	9,312	9,070
West Lafayette	6,270	5,095
Whiting	10,307	10,880
Winchester	5,303	4,487
IOWA:		
Albia	5,157	4,425
Ames	12,555	10,261
Atlantic	5,802	5,585
Boone	12,373	11,886
Burlington	25,832	26,755
Carroll	5,389	4,691
Cedar Falls	9,349	7,362
Cedar Rapids	62,120	56,097
Centerville	8,413	8,147
Chariton	5,754	5,365
Charles City	8,681	8,039
Cherokee	7,469	6,443
Clinton	26,270	25,726
Council Bluffs	41,439	42,048
Creston	8,033	8,615
Davenport	66,039	60,751
Decorah	5,303	4,581
Des Moines	159,819	142,559
Dubuque	43,892	41,679
Estherville	5,051	4,940
Fairfield	6,773	6,619
Fort Dodge	22,904	21,895
Fort Madison	14,063	13,779
Grinnell	5,210	4,949
Iowa City	17,182	15,340
Keokuk	15,076	15,106
Knoxville	6,936	4,697
Le Mars	5,353	4,788
Marshalltown	19,240	17,373
Mason City	27,080	23,304
Muscatine	18,286	16,778
Newton	10,462	11,560
Oelwein	7,801	7,794
Oskaloosa	11,024	10,123
Ottumwa	31,570	28,075
Perry	5,977	5,881
Red Oak	5,763	5,778
Shenandoah	6,846	6,502
Sioux City	82,364	79,183
IOWA—Con.:		
Spencer	6,599	5,019
Storm Lake	5,274	4,157
Washington	5,227	4,814
Waterloo	51,743	46,191
Webster City	6,738	7,024
KANSAS:		
Abilene	5,671	5,658
Arkansas City	12,752	13,946
Atchison	12,648	13,024
Chanute	10,142	10,277
Coffeyville	17,355	16,198
Concordia	6,255	5,792
Dodge City	8,487	10,059
El Dorado	10,045	10,311
Emporia	13,188	14,067
Fort Scott	10,557	10,763
Garden City	6,285	6,121
Great Bend	9,044	5,548
Hays	6,385	4,618
Hutchinson	30,013	27,085
Independence	11,565	12,782
Iola	7,244	7,160
Junction City	8,507	7,407
Kansas City	121,458	121,857
Lawrence	14,390	13,726
Leavenworth	19,220	17,466
McPherson	7,194	6,147
Manhattan	11,659	10,136
Newton	11,048	11,034
Ottawa	10,193	9,563
Parsons	14,294	14,903
Pittsburg	17,571	18,145
Pratt	6,591	6,322
Salina	21,073	20,155
Topeka	67,833	64,120
Wellington	7,246	7,405
Wichita	114,966	111,110
Winfield	9,506	9,398
KENTUCKY:		
Ashland	29,537	29,074
Bellevue	8,741	8,497
Bowling Green	14,585	12,348
Corbin	7,893	8,036
Covington	62,018	65,252
Danville	6,734	6,729
Dayton	8,379	9,071
Fort Thomas	11,034	10,008
Frankfort	11,492	11,626
Glasgow	5,815	5,042
Harlan	5,122	4,327
Hazard	7,397	7,021
Henderson	13,160	11,668
Hopkinsville	11,724	10,746
Jenkins	9,428	8,465
Lexington	49,304	45,736
Louisville	319,077	307,745
Ludlow	6,185	6,485
Madisonville	8,209	6,908
Mayfield	8,619	8,177
Maysville	6,572	6,557
Middlesborough	11,777	10,350
Newport	30,631	29,744
Owensboro	30,245	22,765
Paducah	33,765	33,541
Paris	6,697	6,204
Princeton	5,389	4,764
Richmond	7,335	6,495
Somerset	6,154	5,506
Winchester	8,594	8,233
LOUISIANA:		
Abbeville	6,672	4,356
Alexandria	27,066	23,025
Bastrop	6,626	5,121
Baton Rouge	34,719	30,729
Bogalusa	14,604	14,029
Bossier City	5,786	4,003
Crowley	9,523	7,656
Eunice	5,242	3,597
Gretna	10,879	9,584
Hammond	6,033	6,072
Houma	9,052	6,531
Jackson	5,384	3,966
Jennings	7,343	4,036
Lafayette	19,210	14,635
Lake Charles	21,207	15,791
Minden	6,677	5,023
Monroe	28,309	26,028
Morgan City	6,969	5,985
Natchitoches	6,812	4,547
New Iberia	13,747	8,003
New Orleans	494,537	458,762
Opelousas	8,980	6,299
Plaquemine	5,049	5,124
Ruston	7,107	4,400
Shreveport	98,167	76,655
Tallulah	5,712	3,332
Thibodaux	5,851	4,442
West Monroe	8,560	6,566
MAINE:		
Auburn	19,817	18,571
Augusta	19,360	17,198
Bangor	29,822	28,749
Bath	10,235	9,110
Belfast	5,540	4,993
Biddeford	19,790	17,633
Brewer	6,510	6,329
Brunswick[2]	7,003	6,144
Calais	5,161	5,470
MAINE—Con.:		
Gardiner	6,044	5,609
Lewiston	38,598	34,948
Old Town	7,688	7,266
Presque Isle[2]	5,456	4,662
Portland	73,643	70,810
Rockland	8,899	9,075
Rumford Falls[2]	8,447	8,726
Saco	8,631	7,233
South Portland	15,781	13,840
Waterville	16,688	15,454
Westbrook	11,087	10,807
MARYLAND:		
Annapolis	13,069	12,531
Baltimore	859,100	804,874
Cambridge	10,102	8,544
Cumberland	39,483	37,747
District 12 (Baltimore Co.)[2]	15,436	11,556
District 13 (Baltimore Co.)[2]	13,366	10,466
Frederick	15,802	14,434
Frostburg	7,659	5,588
Hagerstown	32,491	30,861
Hyattsville	6,575	4,264
Salisbury	13,313	10,997
Takoma Park	8,938	6,415
MASSACHUSETTS:		
Abington town	5,708	5,872
Adams town[2]	12,608	12,697
Amesbury town[2]	10,862	11,899
Amherst town[2]	6,410	5,888
Andover town[2]	11,122	9,969
Arlington town[2]	40,013	36,094
Athol town[2]	11,180	10,677
Attleboro	22,071	21,769
Auburn town[2]	6,629	6,147
Barnstable town[2]	8,333	7,271
Belmont town[2]	26,867	21,748
Beverly	25,537	25,086
Boston	770,816	781,188
Braintree town[2]	16,378	15,712
Bridgewater town[2]	8,902	9,055
Brockton	62,343	63,797
Brookline town[2]	49,786	47,490
Cambridge	110,879	113,643
Canton town[2]	6,381	5,816
Chelsea	41,259	45,816
Chicopee	41,664	43,930
Clinton town[2]	12,440	12,817
Concord town[2]	7,972	7,477
Danvers town[2]	14,179	12,957
Dartmouth town[2]	9,011	8,778
Dedham town[2]	15,508	15,136
Dracut town[2]	7,339	6,912
Easthampton town[2]	10,316	11,323
Everett	46,784	48,424
Fairhaven town[2]	10,938	10,951
Fall River	115,428	115,274
Fitchburg	41,824	40,692
Framingham town[2]	23,214	22,210
Franklin town	7,303	7,028
Gardner	20,206	19,399
Gloucester	24,046	24,204
Great Barrington town[2]	5,824	5,934
Greenfield town[2]	15,672	15,500
Haverhill	46,752	48,710
Hingham town[2]	8,003	6,657
Holyoke	53,750	56,537
Hudson town[2]	8,042	8,469
Ipswich town[2]	6,348	5,599
Lawrence	84,323	85,068
Leominster	22,226	21,810
Lexington town[2]	13,187	9,467
Lowell	101,389	100,234
Longmeadow town[2]	5,790	4,437
Ludlow town[2]	8,181	8,876
Lynn	98,123	102,320
Malden	58,010	58,036
Mansfield town[2]	6,530	6,364
Marblehead town[2]	10,856	8,668
Marlborough	15,154	15,587
Maynard town[2]	6,812	7,156
Medford	63,083	59,714
Melrose	25,333	23,170
Methuen town[2]	21,880	21,069
Middleborough town[2]	9,032	8,608
Milford town[2]	15,388	14,741
Millbury town[2]	6,983	6,957
Milton town[2]	18,708	16,434
Montague town[2]	7,582	8,081
Natick town[2]	13,851	13,589
Needham town[2]	12,445	10,845
New Bedford	110,341	112,597
Newburyport	13,916	15,084
Newton	69,873	65,276
North Adams	22,213	21,621
Northampton	24,794	24,381
North Andover town[2]	7,524	6,961
North Attleborough town[2]	10,359	10,197
Northbridge town[2]	10,242	9,713
Norwood town[2]	15,383	15,049
Orange town[2]	5,611	5,365
Palmer town[2]	9,149	9,577
MASSACHUSETTS—Con.:		
Peabody	21,711	21,345
Pittsfield	49,684	49,677
Plymouth town[2]	13,100	13,042
Quincy	75,810	71,983
Randolph town[2]	7,634	6,553
Reading town[2]	10,866	9,767
Revere	34,405	35,680
Rockland town[2]	8,087	7,524
Salem	41,213	43,353
Saugus town[2]	14,825	14,700
Somerset town[2]	5,873	5,398
Somerville	102,177	103,908
Southbridge town[2]	16,825	14,264
South Hadley town[2]	6,856	6,773
Spencer town[2]	6,641	6,272
Springfield	149,554	149,900
Stoneham town[2]	10,765	10,060
Stoughton town[2]	8,632	8,204
Swampscott town[2]	10,761	10,346
Taunton	37,395	37,355
Uxbridge town[2]	6,417	6,285
Wakefield town[2]	16,223	16,318
Walpole town[2]	7,443	7,273
Waltham	40,020	39,247
Ware town[2]	7,557	7,385
Watertown town[2]	35,427	34,913
Webster town[2]	13,186	12,992
Wellesley town[2]	15,127	11,439
Westfield	18,793	19,775
West Springfield town[2]	17,135	16,684
Weymouth town[2]	23,868	20,882
Whitman town[2]	7,759	7,638
Winchendon town[2]	6,575	6,202
Winchester town[2]	15,081	12,719
Winthrop town[2]	16,768	16,852
Woburn	19,751	19,434
Worcester	193,694	195,311
MICHIGAN:		
Adrian	14,230	13,064
Albion	8,345	8,324
Alma	7,202	6,734
Alpena	12,808	12,166
Ann Arbor	29,815	26,944
Battle Creek	43,453	43,573
Bay City	47,956	47,355
Benton Harbor	16,668	15,434
Berkley	6,406	5,571
Birmingham	11,196	9,539
Cadillac	9,855	9,570
Charlotte	5,544	5,307
Cheboygan	5,673	4,923
Coldwater	7,343	6,735
Dearborn	63,584	50,358
Detroit	1,623,452	1,568,662
Dowagiac	5,007	5,550
East Detroit	8,584	5,955
East Lansing	5,839	4,389
Ecorse	13,209	12,716
Escanaba	14,830	14,524
Ferndale	22,523	20,855
Flint	151,543	156,492
Grand Haven	8,799	8,345
Grand Rapids	164,292	168,592
Greenville	5,321	4,730
Grosse Pointe	6,179	5,173
Grosse Pointe Farms	7,217	3,533
Grosse Pointe Park	12,646	11,174
Hamtramck	49,839	56,268
Hancock	5,554	5,795
Hastings	5,175	5,227
Highland Park	50,810	52,959
Hillsdale	6,381	5,896
Holland	14,616	14,346
Inkster	7,044	4,440
Ionia	6,392	6,562
Iron Mountain	11,080	11,652
Ironwood	13,369	14,299
Ishpeming	9,491	9,238
Jackson	49,656	55,187
Kalamazoo	54,097	54,786
Kingsford	5,771	5,526
Lansing	78,753	78,397
Lapeer	5,305	5,008
Lincoln Park	15,230	12,336
Ludington	8,701	8,898
Manistee	8,694	8,078
Manistique	5,399	5,198
Marquette	15,928	14,789
Marshall	5,253	5,019
Menominee	10,230	10,320
Midland	10,329	8,038
Monroe	18,478	18,110
Mount Clemens	14,389	13,497
Mount Pleasant	8,413	5,211
Muskegon	47,697	41,390
Muskegon Heights	16,047	15,584
Negaunee	6,813	6,552
Niles	11,328	11,326
Owosso	14,424	14,496
Petoskey	6,019	5,740
Plymouth	5,360	4,484
Pontiac	66,626	64,928
Port Huron	32,759	31,361
River Rouge	17,008	17,314
Roseville	9,023	6,836
Royal Oak	25,087	22,904

Footnotes at end of table.

Place	1940	1930
MICHIGAN—Con.:		
Saginaw	82,794	80,715
St. Clair Shores	10,405	6,745
St. Joseph	8,963	8,349
Sault Ste. Marie	15,847	13,755
Sturgis	7,214	6,950
Three Rivers	6,710	6,863
Traverse City	14,455	12,539
Trenton	5,284	4,022
Wyandotte	30,618	28,368
Ypsilanti	12,121	10,143
MINNESOTA:		
Albert Lea	12,200	10,169
Alexandria	5,051	3,876
Anoka	6,426	4,851
Austin	18,307	12,276
Bemidji	9,427	7,202
Brainerd	12,071	10,221
Chisholm	7,487	8,308
Cloquet	7,304	6,782
Columbia Heights	6,035	5,613
Crookston	7,161	6,321
Detroit Lakes	5,015	3,675
Duluth	101,065	101,463
Edina	5,855	3,138
Ely	5,970	6,156
Eveleth	6,887	7,484
Fairmont	6,988	5,521
Faribault	14,527	12,767
Fergus Falls	10,848	9,389
Hastings	5,662	5,086
Hibbing	16,385	15,666
International Falls	5,626	5,036
Little Falls	6,047	5,014
Mankato	15,654	14,038
Minneapolis	492,370	464,356
Montevideo	5,220	4,319
Moorhead	9,491	7,651
New Ulm	8,743	7,308
Owatonna	8,694	7,654
Red Wing	9,962	9,629
Richfield	6,750	3,344
Robbinsdale	6,018	4,427
Rochester	26,312	20,621
St. Cloud	24,173	21,000
St. Louis Park	7,737	4,710
St. Paul	287,736	271,606
St. Peter	5,870	4,811
South St. Paul	11,844	10,009
Stillwater	7,013	7,173
Thief River Falls	6,019	4,268
Virginia	12,264	11,963
West St. Paul	5,733	4,463
Willmar	7,623	6,173
Winona	22,490	20,850
Worthington	5,918	3,878
MISSISSIPPI:		
Biloxi	17,475	14,850
Brookhaven	6,232	5,288
Canton	6,011	4,725
Clarksdale	12,168	10,043
Columbia	6,064	4,833
Columbus	13,645	10,743
Corinth	7,818	6,220
Greenville	20,892	14,807
Greenwood	14,767	11,123
Grenada	5,831	4,349
Gulfport	15,195	12,547
Hattiesburg	21,026	18,601
Jackson	62,107	48,282
Laurel	20,598	18,017
McComb	9,898	10,057
Meridian	35,481	31,954
Natchez	15,296	13,422
Pascagoula	5,900	4,339
Picayune	5,129	4,698
Tupelo	8,212	6,361
Vicksburg	24,460	22,943
West Point	5,627	4,677
Yazoo City	7,258	5,579
MISSOURI:		
Boonville	6,089	6,435
Brookfield	6,174	6,428
Cape Girardeau	19,426	16,227
Carthage	10,585	9,736
Caruthersville	6,612	4,781
Charleston	5,182	3,357
Chillicothe	8,012	8,177
Clayton	13,069	9,613
Clinton	6,041	5,744
Columbia	18,399	14,967
De Soto	5,121	5,069
Ferguson	5,724	3,798
Flat River	5,401	..
Fulton	8,297	6,105
Hannibal	20,865	22,761
Independence	16,066	15,296
Jefferson City	24,268	21,596
Joplin	37,144	33,454
Kansas City	399,178	399,746
Kennett	6,335	4,128
Kirksville	10,080	8,293
Kirkwood	12,132	9,169
Lebanon	5,025	3,562
Lexington	5,341	4,595
Maplewood	12,875	12,657
Marshall	8,533	8,103
Maryville	5,700	5,217
Mexico	9,053	8,200
MISSOURI—Con.:		
Moberly	12,920	13,772
Neosho	5,318	4,485
Nevada	8,181	7,448
Poplar Bluff	11,163	7,551
Richmond Heights	12,802	9,150
Rolla	5,141	3,670
St. Charles	10,803	10,491
St. Joseph	75,711	80,935
St. Louis	816,048	821,960
Sedalia	20,428	20,806
Sikeston	7,944	5,676
Springfield	61,238	57,527
Trenton	7,046	6,992
University City	33,023	25,809
Warrensburg	5,868	5,146
Washington	6,756	5,918
Webb City	7,033	6,876
Webster Groves	18,394	16,487
MONTANA:		
Anaconda	11,004	12,494
Billings	23,261	16,380
Bozeman	8,665	6,855
Butte	37,081	39,532
Great Falls	29,928	28,822
Havre	6,427	6,372
Helena	15,056	11,803
Kalispell	8,245	6,094
Lewistown	5,874	5,358
Livingston	6,642	6,391
Miles City	7,313	7,175
Missoula	18,449	14,657
NEBRASKA:		
Alliance	6,253	6,669
Beatrice	10,883	10,297
Columbus	7,632	6,808
Fairbury	6,304	6,192
Falls City	6,146	5,787
Fremont	11,862	11,407
Grand Island	19,130	18,041
Hastings	15,145	15,490
Kearney	9,643	8,575
Lincoln	81,984	75,933
McCook	6,212	6,688
Nebraska City	7,339	7,230
Norfolk	10,490	10,717
North Platte	12,429	12,061
Omaha	223,844	214,006
Scottsbluff	12,057	8,465
York	5,383	5,712
NEVADA:		
Las Vegas	8,422	5,165
Reno	21,317	18,529
Sparks	5,318	4,508
NEW HAMPSHIRE:		
Berlin	19,084	20,018
Claremont town	12,144	12,377
Concord	27,171	25,228
Derry town	5,400	5,131
Dover	14,990	13,573
Exeter town	5,398	4,872
Franklin	6,749	6,576
Keene	13,832	13,794
Laconia	13,484	12,471
Lebanon town	7,590	7,073
Manchester	77,685	76,834
Nashua	32,927	31,463
Newport town	5,304	4,659
Portsmouth	14,821	14,495
Rochester	12,012	10,209
Somersworth	6,136	5,680
NEW JERSEY:		
Asbury Park	14,617	14,981
Atlantic City	64,094	66,198
Audubon	8,906	8,904
Bayonne	79,198	88,979
Belleville	28,167	26,974
Bergenfield	10,275	8,816
Bloomfield	41,623	38,077
Bogota	7,346	7,341
Boonton	6,739	6,866
Bound Brook	7,616	7,372
Bridgeton	15,992	15,699
Burlington	10,905	10,844
Camden	117,536	118,700
Carlstadt	5,644	5,425
Carteret	11,976	13,339
Cliffside Park	16,892	15,267
Clifton	48,827	46,875
Collingswood	12,685	12,723
Cranford township	12,860	11,126
Dover	10,491	10,031
Dumont	7,556	5,861
Dunellen	5,360	5,148
East Orange	68,945	68,020
East Rutherford	7,268	7,080
Elizabeth	109,912	114,589
Englewood	18,966	17,805
Fair Lawn	9,017	5,990
Fairview	8,770	9,067
Fort Lee	9,468	8,759
Freehold	6,952	6,894
Garfield	28,044	29,739
Glen Ridge	7,331	7,365
Glen Rock	5,177	4,369
Gloucester City	13,692	13,796
Guttenberg	6,200	6,535
NEW JERSEY—Con.:		
Hackensack	26,279	24,568
Haddonfield	9,742	8,857
Haddon Heights	5,555	5,394
Haledon	5,303	4,812
Hammonton	7,668	7,656
Harrison	14,171	15,601
Hasbrouck Heights	6,716	5,658
Hawthorne	12,610	11,868
Highland Park	9,002	8,691
Hillside township	18,556	17,601
Hoboken	50,115	59,261
Irvington	55,328	56,733
Jersey City	301,173	316,715
Kearny	39,467	40,716
Keyport	5,147	4,940
Leonia	5,763	5,350
Linden	24,115	21,206
Lodi	11,552	11,549
Long Branch	17,408	18,399
Lyndhurst twp.	17,454	17,362
Madison	7,944	7,481
Manville	6,065	5,441
Maplewood twp.	23,139	21,321
Metuchen	6,557	5,748
Millburn township	11,652	8,602
Millville	14,806	14,705
Montclair	39,807	42,017
Morristown	15,270	15,197
Neptune township	10,207	10,625
Newark	429,760	442,337
New Brunswick	33,180	34,555
Newton	5,533	5,401
North Arlington	9,904	8,263
North Bergen township	39,714	40,714
North Plainfield	10,586	9,760
Nutley	21,954	20,572
Orange	35,717	35,399
Palisades Park	8,141	7,065
Palmyra	5,178	4,968
Passaic	61,394	62,959
Paterson	139,656	138,513
Paulsboro	7,011	7,121
Pennsauken twp.	17,745	16,915
Penns Grove	6,488	5,895
Perth Amboy	41,242	43,516
Phillipsburg	18,314	19,255
Pitman	5,507	5,411
Plainfield	37,469	34,422
Pleasantville	11,050	11,580
Princeton	7,719	6,992
Prospect Park	5,714	5,909
Rahway	17,498	16,011
Red Bank	10,974	11,622
Ridgefield	5,271	4,671
Ridgefield Park	11,277	10,764
Ridgewood	14,948	12,788
Roselle	13,597	13,021
Roselle Park	9,661	8,969
Rutherford	15,466	14,915
Salem	8,618	8,047
Sayreville	8,186	8,658
Secaucus	9,754	8,950
Somerville	8,720	8,255
South Amboy	7,802	8,476
South Orange	13,742	13,630
South Plainfield	5,379	5,047
South River	10,714	10,759
Summit	16,165	14,556
Teaneck township	25,275	16,513
Tenafly	7,413	5,669
Totowa	5,130	4,600
Trenton	124,697	123,356
Union City	56,173	58,659
Union township	24,730	16,472
Ventnor City	7,905	6,674
Verona	8,957	7,161
Vineland	7,914	7,556
Wallington	8,981	9,063
Weehawken township	14,363	14,807
Westfield	18,458	15,801
West New York	39,439	37,107
West Orange	25,662	24,327
Westwood	5,388	4,861
Wildwood	5,150	5,330
Woodbridge township	27,191	25,266
Woodbury	8,306	8,172
Wood-Ridge	5,739	5,159
NEW MEXICO:		
Albuquerque	35,449	26,570
Carlsbad	7,116	3,708
Clovis	10,065	8,027
Gallup	7,041	5,992
Hobbs	10,619	598
Las Cruces	8,385	5,811
Las Vegas city	5,941	4,719
Las Vegas town	6,421	4,378
Portales	5,104	2,519
Raton	7,607	6,090
Roswell	13,482	11,173
Santa Fe	20,325	11,176
Silver City	5,044	3,519
Tucumcari	6,194	4,143
NEW YORK:		
Albany	130,577	127,412
Amityville	5,058	4,437
Amsterdam	33,329	34,817
NEW YORK—Con.:		
Auburn	35,753	36,652
Batavia	17,267	17,375
Beacon	12,572	11,933
Binghamton	78,309	76,662
Bronxville	6,888	6,387
Buffalo	575,901	573,076
Canandaigua	8,321	7,541
Catskill	5,429	5,082
Cedarhurst	5,463	5,065
Cohoes	21,955	23,226
Corning	16,212	15,777
Cortland	15,881	15,043
Depew	6,084	6,536
Dobbs Ferry	5,883	5,741
Dunkirk	17,713	17,802
East Aurora	5,253	4,815
East Rochester	6,691	6,627
East Rockaway	5,610	4,340
Elmira	45,106	47,397
Endicott	17,702	16,231
Floral Park	12,950	10,016
Fredonia	5,738	5,814
Freeport	20,410	15,467
Fulton	13,362	12,462
Garden City	11,223	7,186
Geneva	15,555	16,055
Glen Cove	12,415	11,430
Glens Falls	18,836	18,531
Gloversville	23,329	23,099
Great Neck	6,167	4,016
Hamburg	5,467	4,731
Hastings-on-Hudson	7,057	7,997
Haverstraw	5,909	5,623
Hempstead	20,856	12,650
Herkimer	9,617	10,446
Hornell	15,649	16,256
Hudson	11,517	12,337
Hudson Falls	6,654	6,449
Ilion	8,927	9,806
Irondequoit town[2]	23,376	18,02[illegible]
Ithaca	19,730	20,702
Jamestown	42,638	45,155
Johnson City	18,039	13,567
Johnstown	10,666	10,80[illegible]
Kenmore	18,612	16,48[illegible]
Kingston	28,589	28,082
Lackawanna	24,058	23,943
Lancaster	7,236	7,04[illegible]
Larchmont	5,970	5,28[illegible]
Little Falls	10,163	11,10[illegible]
Lockport	24,379	23,164
Long Beach	9,036	5,81[illegible]
Lynbrook	14,557	11,99[illegible]
Malone	8,743	8,65[illegible]
Malverne	5,153	2,25[illegible]
Mamaroneck	13,034	11,76[illegible]
Massena	11,328	10,63[illegible]
Mechanicville	7,449	7,92[illegible]
Medina	5,871	6,07[illegible]
Middletown	21,908	21,27[illegible]
Mineola	10,064	8,15[illegible]
Mount Kisco	5,941	5,12[illegible]
Mount Vernon	67,362	61,49[illegible]
Newark	9,646	7,64[illegible]
Newburgh	31,883	31,27[illegible]
New Rochelle	58,408	54,00[illegible]
New York City	7,454,995	6,930,44[illegible]
Bronx Borough	1,394,711	1,265,25[illegible]
Brooklyn Borough	2,698,285	2,560,40[illegible]
Manhattan Borough	1,889,924	1,867,31[illegible]
Queens Borough	1,297,634	1,079,12[illegible]
Richmond Borough	174,441	158,34[illegible]
Niagara Falls	78,029	75,46[illegible]
North Pelham	5,052	4,89[illegible]
North Tarrytown	8,804	7,41[illegible]
North Tonawanda	20,254	19,01[illegible]
Norwich	8,694	8,37[illegible]
Nyack	5,206	5,39[illegible]
Ogdensburg	16,346	16,91[illegible]
Olean	21,506	21,79[illegible]
Oneida	10,291	10,55[illegible]
Oneonta	11,731	12,53[illegible]
Ossining	15,996	15,24[illegible]
Oswego	22,062	22,65[illegible]
Owego	5,068	4,74[illegible]
Patchogue	7,181	6,86[illegible]
Peekskill	17,311	17,12[illegible]
Pelham Manor	5,302	4,90[illegible]
Penn Yan	5,308	5,32[illegible]
Plattsburgh	16,351	13,34[illegible]
Port Chester	23,073	22,66[illegible]
Port Jervis	9,749	10,24[illegible]
Poughkeepsie	40,478	40,28[illegible]
Rensselaer	10,768	11,22[illegible]
Rochester	324,975	328,13[illegible]
Rockville Centre	18,613	13,71[illegible]
Rome	34,214	32,33[illegible]
Rye	9,865	8,71[illegible]
Salamanca	9,011	9,57[illegible]
Saranac Lake	7,138	8,02[illegible]
Saratoga Springs	13,705	13,16[illegible]
Scarsdale	12,966	9,60[illegible]
Schenectady	87,549	95,60[illegible]
Scotia	7,960	7,43[illegible]
Seneca Falls	6,452	6,44[illegible]
Solvay	8,201	7,98[illegible]
Syracuse	205,967	209,32[illegible]

Footnotes at end of table.

Place	1940	1930
NEW YORK—Con.:		
Tarrytown	6,874	6,841
Tonawanda	13,008	12,681
Troy	70,304	72,763
Tuckahoe	6,563	6,138
Tupper Lake	5,451	5,271
Utica	100,518	101,740
Valley Stream	16,679	11,790
Watertown	33,385	32,205
Watervliet	16,114	16,083
Waverly	5,450	5,662
Wellsville	5,942	5,674
White Plains	40,327	35,830
Williston Park	5,750	4,427
Yonkers	142,598	134,646
NORTH CAROLINA:		
Asheboro	6,981	5,021
Asheville	51,310	50,193
Burlington	12,198	9,737
Canton	5,037	5,117
Charlotte	100,899	82,675
Concord	15,572	11,820
Dunn	5,256	4,558
Durham	60,195	52,037
Elizabeth City	11,564	10,037
Fayetteville	17,428	13,049
Forest City	5,035	4,069
Gastonia	21,313	17,093
Goldsboro	17,274	14,985
Greensboro	59,319	53,569
Greenville	12,674	9,194
Hamlet	5,111	4,801
Henderson	7,647	6,345
Hendersonville	5,381	5,079
Hickory	13,487	7,363
High Point	38,495	36,745
Kings Mountain	6,547	5,632
Kinston	15,388	11,362
Laurinburg	5,685	3,312
Lenoir	7,598	6,532
Lexington	10,550	9,652
Lumberton	5,803	4,140
Monroe	6,475	6,100
Mooresville	6,682	5,619
Morganton	7,679	6,001
Mount Airy	6,286	6,045
New Bern	11,815	11,981
Newton	5,407	4,394
Raleigh	46,897	37,379
Reidsville	10,387	6,851
Roanoke Rapids	8,545	3,404
Rocky Mount	25,568	21,412
Salisbury	19,037	16,951
Shelby	14,037	10,789
Statesville	11,440	10,490
Tarboro	7,148	6,379
Thomasville	11,041	10,090
Washington	8,569	7,035
Wilmington	33,407	32,270
Wilson	19,234	12,613
Winston-Salem	79,815	75,274
NORTH DAKOTA:		
Bismarck	15,496	11,090
Devils Lake[7]	6,204	5,519
Dickinson	5,839	5,025
Fargo	32,580	28,619
Grand Forks	20,228	17,112
Jamestown	8,790	8,187
Mandan	6,685	5,037
Minot	16,577	16,099
Valley City	5,917	5,268
Williston	5,790	5,106
OHIO:		
Akron	244,791	255,040
Alliance	22,405	23,047
Ashland	12,453	11,141
Ashtabula	21,405	23,301
Athens	7,696	7,252
Barberton	24,028	23,934
Barnesville	5,002	4,602
Bedford	7,390	6,814
Bellaire	13,799	13,327
Bellefontaine	9,808	9,543
Bellevue	6,127	6,256
Berea	6,025	5,697
Bexley	8,705	7,396
Bowling Green	7,190	6,688
Bryan	5,404	4,689
Bucyrus	9,727	10,027
Cambridge	15,044	16,129
Campbell	13,785	14,673
Canton	108,401	104,906
Cheviot	9,043	8,046
Chillicothe	20,129	18,340
Cincinnati	455,610	451,160
Circleville	7,982	7,369
Cleveland	878,336	900,429
Cleveland Heights	54,992	50,045
Columbus	306,087	290,564
Conneaut	9,355	9,691
Coshocton	11,509	10,908
Cuyahoga Falls	20,546	19,797
Dayton	210,718	200,982
Defiance	9,744	8,818
Delaware	8,944	8,675
Delphos	5,746	5,672
Dover	9,691	9,716
East Cleveland	39,495	39,667
OHIO—Con.:		
East Liverpool	23,555	23,329
East Palestine	5,123	5,215
Elyria	25,120	25,633
Euclid	17,866	12,751
Findlay	20,228	19,363
Fostoria	13,453	12,790
Fremont	14,710	13,422
Galion	8,685	7,674
Gallipolis	7,832	7,106
Garfield Heights	16,989	15,589
Girard	9,805	9,859
Grandview Heights	6,960	6,358
Greenville	7,745	7,036
Hamilton	50,592	52,176
Ironton	15,851	16,621
Jackson	6,295	5,922
Kent	8,581	8,375
Kenton	7,593	7,009
Lakewood	69,160	70,509
Lancaster	21,940	18,716
Lima	44,711	42,287
Lockland	5,601	5,793
Logan	6,177	6,080
Lorain	44,125	44,512
Mansfield	37,154	33,525
Maple Heights	6,728	5,950
Marietta	14,543	14,285
Marion	30,817	31,084
Martins Ferry	14,729	14,524
Massillon	26,644	26,400
Miamisburg	5,544	5,518
Middletown	31,220	29,992
Mingo Junction	5,192	5,030
Mount Vernon	10,122	9,370
Nelsonville	5,368	5,322
Newark	31,487	30,596
New Boston	6,024	5,931
New Philadelphia	12,328	12,365
Niles	16,273	16,314
North College Hill	5,231	4,139
Norwalk	8,211	7,776
Norwood	34,010	33,411
Oakwood	7,652	6,494
Painesville	12,235	10,944
Parma	16,365	13,899
Piqua	16,049	16,009
Portsmouth	40,466	42,560
Ravenna	8,538	8,019
Reading	6,079	5,723
Rocky River	8,291	5,632
St. Bernard	7,387	7,487
St. Marys	5,532	5,433
Salem	12,301	10,622
Sandusky	24,874	24,622
Shaker Heights	23,393	17,783
Shelby	6,643	6,198
Sidney	9,790	9,301
South Euclid	6,146	4,399
Springfield	70,662	68,743
Steubenville	37,651	35,422
Struthers	11,739	11,249
Tiffin	16,102	16,428
Toledo	282,349	290,718
Toronto	7,426	7,044
Troy	9,697	8,675
Uhrichsville	6,435	6,437
University Heights	5,981	2,237
Upper Arlington	5,370	3,059
Urbana	8,335	7,742
Van Wert	9,227	8,472
Wadsworth	6,495	5,930
Wapakoneta	5,225	5,378
Warren	42,837	41,062
Washington Court House	9,402	8,426
Wellston	5,537	5,319
Wellsville	7,672	7,956
Wilmington	5,971	5,332
Wooster	11,543	10,742
Xenia	10,633	10,507
Youngstown	167,720	170,002
Zanesville	37,500	36,440
OKLAHOMA:		
Ada	15,143	11,261
Altus	8,593	8,439
Alva	5,055	5,121
Anadarko	5,579	5,036
Ardmore	16,886	15,741
Bartlesville	16,267	14,763
Blackwell	8,537	9,521
Bristow	6,050	6,619
Chickasha	14,111	14,099
Clinton	6,736	7,512
Cushing	7,703	9,301
Duncan	9,207	8,363
Durant	10,027	7,463
Elk City	5,021	5,666
El Reno	10,078	9,384
Enid	28,081	26,399
Frederick	5,109	4,568
Guthrie	10,018	9,582
Henryetta	6,905	7,694
Hobart	5,177	4,982
Holdenville	6,632	7,268
Hugo	5,909	5,272
Lawton	18,055	12,121
McAlester	12,401	11,804
Miami	8,345	8,064
Muskogee	32,332	32,026
Norman	11,429	9,603
OKLAHOMA—Con.:		
Oklahoma City	204,424	185,389
Okmulgee	16,051	17,097
Pauls Valley	5,104	4,235
Pawhuska	5,443	5,931
Perry	5,045	4,206
Picher	5,848	7,773
Ponca City	16,794	16,136
Sapulpa	12,240	10,533
Sand Springs	6,137	6,074
Seminole	11,547	11,459
Shawnee	22,053	23,283
Stillwater	10,097	7,016
Tulsa	142,157	141,258
Vinita	5,685	4,263
Wewoka	10,315	10,401
Woodward	5,406	5,056
OREGON:		
Albany	5,654	5,325
Astoria	10,389	10,349
Baker	9,342	7,858
Bend	10,021	8,848
Corvallis	8,392	7,585
Eugene	20,838	18,901
Grants Pass	6,028	4,666
Klamath Falls	16,497	16,093
La Grande	7,747	8,050
Marshfield	5,259	5,287
Medford	11,281	11,007
Oregon City	6,124	5,761
Pendleton	8,847	6,621
Portland	305,394	301,815
Salem	30,908	26,266
The Dalles	6,266	5,883
PENNSYLVANIA:		
Abington township[2]	20,857	18,648
Aliquippa	27,023	27,116
Allentown	96,904	92,563
Altoona	80,214	82,054
Ambridge	18,968	20,227
Archbald	8,296	9,587
Arnold	10,898	10,575
Ashland	7,045	7,164
Ashley	6,371	7,093
Avalon	6,155	5,940
Bangor	5,687	5,824
Beaver	5,641	5,665
Beaver Falls	17,098	17,147
Bellefonte	5,304	4,804
Bellevue	10,488	10,252
Berwick	13,181	12,660
Bethlehem	58,490	57,892
Blairsville	5,002	5,296
Blakely	8,106	8,260
Bloomsburg	9,799	9,093
Brackenridge	6,400	6,250
Braddock	18,326	19,329
Bradford	17,691	19,306
Brentwood	7,552	5,381
Bridgeport	5,904	5,595
Bristol	11,895	11,799
Brownsville	8,015	2,869
Butler	24,477	23,568
Canonsburg	12,599	12,558
Carbondale	19,371	20,061
Carlisle	13,984	12,596
Carnegie	12,663	12,497
Centerville	6,317	6,467
Chambersburg	14,852	13,788
Charleroi	10,784	11,260
Cheltenham township[2]	19,082	15,731
Chester	59,285	59,164
Clairton	16,381	15,291
Clearfield	9,372	9,221
Coaldale	6,163	6,921
Coatesville	14,006	14,582
Collingdale (Darby P. O.)	8,162	7,857
Columbia	11,547	11,349
Connellsville	13,608	13,290
Conshohocken	10,776	10,815
Coraopolis	11,086	10,724
Corry	6,935	7,152
Crafton	7,163	7,004
Danville	7,122	7,185
Darby	10,334	9,899
Dickson City	11,548	12,395
Donora	13,180	13,905
Dormont	12,974	13,190
Du Bois	12,080	11,595
Dunmore	23,086	22,627
Dupont	5,278	5,161
Duquesne	20,693	21,396
Duryea	8,275	8,503
Easton	33,589	34,468
East Pittsburgh	6,079	6,214
East Stroudsburg	6,404	6,099
Edwardsville	7,998	8,847
Ellwood City	12,329	12,323
Emmaus	6,731	6,419
Ephrata	6,199	4,988
Erie	116,955	115,967
Etna	7,223	7,493
Exeter	5,802	5,724
Farrell	13,899	14,359
Ford City	5,795	6,127
Forest Hills	5,248	4,549
Forty Fort	6,293	6,224
PENNSYLVANIA—Con.:		
Frackville	8,035	8,034
Franklin	9,948	10,254
Freeland	6,593	7,098
Gettysburg	5,916	5,584
Glassport	8,748	8,390
Greensburg	16,743	16,508
Greenville	8,149	8,628
Grove City	6,296	6,156
Hanover	13,076	11,805
Hanover township[2]	16,439	17,770
Harrisburg	83,803	80,339
Harrison township[2]	13,161	12,387
Haverford township[2]	27,594	21,362
Hazleton	38,009	36,765
Hollidaysburg	5,910	5,969
Homestead	19,041	20,141
Honesdale	5,687	5,490
Huntington	7,170	7,558
Indiana	10,050	9,569
Jeannette	16,220	15,126
Jenkintown	5,024	4,797
Jersey Shore	5,432	5,781
Johnstown	66,668	66,993
Kane	6,133	6,232
Kingston	20,679	21,600
Kittanning	7,550	7,808
Kulpmont	6,159	6,120
Lancaster	61,345	59,949
Lansdale	9,316	8,379
Lansdowne[8]	10,837	9,023
Lansford	8,710	9,632
Larksville	8,467	9,322
Latrobe	11,111	10,644
Lebanon	27,206	25,561
Lehighton	6,615	6,490
Lewistown	13,017	13,357
Lock Haven	10,810	9,668
Lower Merion township[2]	39,566	35,166
Luzerne	7,082	6,950
McAdoo	5,127	5,239
McKeesport	55,355	54,632
McKees Rocks	17,021	18,116
Mahanoy City	13,442	14,784
Meadville	18,919	16,698
Mechanicsburg	5,709	5,647
Media	5,351	5,372
Middletown	7,046	6,085
Midland	6,373	6,007
Millvale	7,811	8,166
Milton	8,313	8,552
Minersville	8,686	9,392
Monaca	7,061	4,641
Monessen	20,257	20,268
Monongahela City	8,825	8,675
Morrisville	5,493	5,368
Mount Carmel	17,780	17,967
Mount Lebanon township[2]	19,571	13,403
Mount Oliver	6,981	7,071
Mount Pleasant	5,824	5,869
Munhall	13,900	12,995
Nanticoke	24,387	26,043
Nanty-Glo	6,217	5,598
Narberth	5,217	4,669
Nazareth	5,721	5,505
New Brighton	9,630	9,950
New Castle	47,638	48,674
New Kensington	24,055	16,762
Northampton	9,622	9,839
Norristown	38,181	35,853
North Braddock	15,679	16,782
Oakmont	6,260	6,027
Oil City	20,379	22,075
Old Forge	11,892	12,661
Olyphant	9,252	10,743
Palmerton	7,475	7,678
Palmyra	5,239	4,377
Philadelphia	1,931,334	1,950,961
Phoenixville	12,282	12,029
Pitcairn	6,310	6,317
Pittsburgh	671,659	669,817
Pittston	17,828	18,246
Plains township[2]	15,621	16,044
Plymouth	15,507	16,543
Pottstown	20,194	19,430
Pottsville	24,530	24,300
Prospect Park	5,100	4,623
Punxsutawney	9,482	9,266
Quakertown	5,150	4,883
Rankin	7,470	7,956
Reading	110,568	111,171
Ridgway	6,253	6,313
Rochester	7,441	7,726
St. Clair	6,809	7,296
St. Marys	7,653	7,433
Sayre	7,569	7,902
Schuylkill Haven	6,518	6,514
Scottdale	6,493	6,714
Scranton	140,404	143,433
Sewickley	5,614	5,599
Shaler township[2]	11,185	9,573
Shamokin	18,810	20,274
Sharon	25,622	25,908
Sharpsburg	8,202	8,642
Sharpsville	5,129	5,194
Shenandoah	19,790	21,782
Shippensburg	5,244	4,345
Somerset	5,430	4,395

Footnotes at end of table.

Place	1940	1930
PENNSYLVANIA—Con.:		
South Williamsport	6,033	6,058
State College	6,226	4,450
Steelton	13,115	13,291
Stowe township[2]	12,577	13,368
Stroudsburg	6,186	5,961
Summit Hill	5,406	5,567
Sunbury	15,462	15,626
Swissvale	15,919	16,029
Swoyerville	9,234	9,133
Tamaqua	12,486	12,936
Tarentum	9,846	9,556
Taylor	9,002	10,428
Throop	7,382	8,027
Titusville	8,126	8,055
Turtle Creek	9,805	10,690
Tyrone	8,845	9,042
Uniontown	21,819	19,544
Upper Darby township[8]	56,883	47,145
Vandergrift	10,725	11,479
Warren	14,891	14,863
Washington	26,166	24,545
Waynesboro	10,231	10,167
West Chester	13,289	12,325
West Hazleton	7,523	7,310
West Pittston	7,943	7,940
West View	7,215	6,028
West York	5,590	5,381
Wilkes-Barre	86,236	86,626
Wilkinsburg	29,853	29,639
Williamsport	44,355	45,729
Wilmerding	5,662	6,291
Wilson	8,217	8,265
Windber	9,057	9,205
Winton	7,989	8,508
Yeadon	8,524	5,430
York	56,712	55,254
RHODE ISLAND:		
Barrington town[2]	6,231	5,162
Bristol town[2]	11,159	11,953
Burrillville town[2]	8,185	7,677
Central Falls	25,248	25,898
Cranston	47,085	42,911
Cumberland town[2]	10,625	10,304
East Providence town[2]	32,165	29,995
Johnston town[2]	10,672	9,357
Lincoln town[2]	10,577	10,421
Newport	30,532	27,612
North Providence town[2]	12,156	11,104
Pawtucket	75,797	77,149
Providence	253,504	252,981
Warren town[2]	8,158	7,974
Warwick	28,757	23,196
Westerly town[2]	11,199	10,997
West Warwick town[2]	18,188	17,696
Woonsocket	49,303	49,376
SOUTH CAROLINA:		
Aiken	6,168	6,033
Anderson	19,424	14,383
Camden	5,747	5,183
Charleston	71,275	62,265
Chester	6,392	5,528
Clinton	5,704	5,643
Columbia	62,396	51,581
Conway	5,066	3,011
Darlington	6,236	5,556
Easley	5,183	4,886
Florence	16,054	14,774
Gaffney	7,636	6,827
Georgetown	5,559	5,082
Greenville	34,734	29,154
Greenwood	13,020	11,020
Hartsville	5,399	5,067
Laurens	6,894	5,443
Marion	5,746	4,921
Newberry	7,510	7,298
Orangeburg	10,521	8,776
Rock Hill	15,009	11,322
Spartanburg	32,249	28,723
Sumter	15,874	11,780
Union	8,478	7,419
SOUTH DAKOTA:		
Aberdeen	17,015	16,465
Brookings	5,346	4,376
Huron	10,843	10,946
Lead	7,520	5,733
Madison	5,018	4,289
Mitchell	10,633	10,942
Rapid City	13,844	10,404
Sioux Falls	40,832	33,362
Watertown	10,617	10,214
Yankton	6,798	6,072
TENNESSEE:		
Alcoa	5,131	5,255
Athens	6,930	5,385
Bristol[9]	14,044	12,005
Chattanooga	128,163	119,798
Clarksville	11,831	9,242
Cleveland	11,351	9,136
Columbia	10,579	7,882
Dyersburg	10,034	8,733
Elizabethton	8,516	8,093
Greeneville	6,784	5,544
Harriman	5,620	4,588
Humboldt	5,160	4,613
Jackson	24,332	22,172
Johnson City	25,332	25,080
Kingsport	14,404	11,914
Knoxville	111,580	105,802
Lebanon	5,950	4,656
Maryville	5,609	4,958
Memphis	292,942	253,143
Morristown	8,050	7,305
Murfreesboro	9,495	7,993
Nashville	167,402	153,866
Paris	6,395	8,164
Pulaski	5,314	3,367
Shelbyville	6,537	5,010
Springfield	6,668	5,577
Union City	7,256	5,865
TEXAS:		
Abilene	26,612	23,175
Alamo Heights	5,700	3,874
Alice	7,792	4,239
Amarillo	51,686	43,132
Austin	87,930	53,120
Bay City	6,594	4,070
Beaumont	59,061	57,732
Beeville	6,789	4,806
Big Spring	12,604	13,735
Bonham	6,349	5,655
Borger	10,018	6,532
Brady	5,002	3,983
Breckenridge	5,826	7,569
Brenham	6,435	5,974
Brownsville	22,083	22,021
Brownwood	13,398	12,789
Bryan	11,842	7,814
Cameron	5,040	4,565
Childress	6,464	7,163
Cleburne	10,558	11,539
Coleman	6,054	6,078
Colorado	5,213	4,671
Corpus Christi	57,301	27,741
Corsicana	15,232	15,202
Crystal City	6,529	6,609
Cuero	5,474	4,672
Dallas	294,734	260,475
Del Rio	13,343	11,693
Denison	15,581	13,850
Denton	11,192	9,587
Eagle Pass	6,459	5,059
Edinburg	8,718	4,821
Electra	5,588	6,712
El Paso	96,810	102,421
Ennis	7,087	7,069
Fort Worth	177,662	163,447
Gainesville	9,651	8,915
Galveston	60,862	52,938
Goose Creek	6,929	5,208
Graham	5,175	4,981
Greenville	13,995	12,407
Harlingen	13,306	12,124
Henderson	6,437	2,932
Highland Park	10,288	8,422
Hillsboro	7,799	7,823
Houston	384,514	292,352
Huntsville	5,108	5,028
Jacksonville	7,213	6,748
Kerrville	5,572	4,546
Kilgore[3]	6,708	..
Kingsville	7,782	6,815
Lamesa	6,038	3,528
Laredo	39,274	32,618
Lockhart	5,018	4,367
Longview	13,758	5,036
Lubbock	31,853	20,520
Lufkin	9,567	7,311
McAllen	11,877	9,074
McKinney	8,555	7,307
Marlin	6,542	5,338
Marshall	18,410	16,203
Mercedes	7,624	6,608
Mexia	6,410	6,579
Midland	9,352	5,484
Mineral Wells	6,303	5,986
Mission	5,982	5,120
Nacogdoches	7,538	5,687
Navasota	6,138	5,128
New Braunfels	6,976	6,242
Odessa	9,573	2,407
Orange	7,472	7,913
Palestine	12,144	11,445
TEXAS—Con.:		
Pampa	12,895	10,470
Paris	18,678	15,649
Plainview	8,263	8,834
Port Arthur	46,140	50,902
Robstown	6,780	4,183
Rusk	5,699	3,859
San Angelo	25,802	25,308
San Antonio	253,854	231,542
San Benito	9,501	10,753
San Marcos	6,006	5,134
Seguin	7,006	5,225
Sherman	17,156	15,713
Sulphur Springs	6,742	5,417
Sweetwater	10,367	10,848
Taylor	7,875	7,463
Temple	15,344	15,345
Terrell	10,481	8,795
Texarkana, Tex.[10]	17,019	16,602
Texas City	5,748	3,534
Tyler	28,279	17,113
University Park	14,458	4,200
Uvalde	6,679	5,286
Vernon	9,277	9,137
Victoria	11,566	7,421
Waco	55,982	52,848
Waxahachie	8,655	8,042
Weatherford	5,924	4,912
Weslaco	6,883	4,879
West University Place	9,221	1,322
Wichita Falls	45,112	43,690
UTAH:		
Brigham	5,641	5,093
Logan	11,868	9,979
Murray	5,740	5,172
Ogden	43,688	40,272
Price	5,214	4,084
Provo	18,071	14,766
Salt Lake City	149,934	140,267
South Salt Lake[3]	5,701	..
Tooele	5,001	5,135
VERMONT:		
Barre	10,909	11,307
Bennington	7,628	7,390
Brattleboro	9,622	8,709
Burlington	27,686	24,789
Montpelier	8,006	7,837
Rutland	17,082	17,315
St. Albans	8,037	8,020
St. Johnsbury	7,437	7,920
Springfield	5,182	4,943
Winooski	6,036	5,308
VIRGINIA:		
Alexandria	33,523	24,149
Arlington County[2]	57,040	26,615
Bristol[11]	9,768	8,840
Charlottesville	19,400	15,245
Clifton Forge	6,461	6,839
Covington	6,300	6,538
Danville	32,749	22,247
Fredericksburg	10,066	6,819
Hampton	5,898	6,382
Harrisonburg	8,768	7,232
Hopewell	8,679	11,327
Lynchburg	44,541	40,661
Marion	5,177	4,156
Martinsville	10,080	7,705
Newport News	37,067	34,417
Norfolk	144,332	129,710
Petersburg	30,631	28,564
Portsmouth	50,745	45,704
Pulaski	8,792	7,168
Radford	6,990	6,227
Richmond	193,042	182,929
Roanoke	69,287	69,206
Salem	5,737	4,833
South Boston	5,252	4,841
South Norfolk	8,038	7,857
Staunton	13,337	11,990
Suffolk	11,343	10,271
Waynesboro	7,373	6,226
Winchester	12,095	10,855
STATE OF WASHINGTON:		
Anacortes	5,875	6,564
Aberdeen	18,846	21,723
Bellingham	29,314	30,823
Bremerton	15,134	10,170
Centralia	7,414	8,058
Ellensburg	5,944	4,621
Everett	30,224	30,567
Hoquiam	10,835	12,766
Kelso	6,749	6,260
STATE OF WASHINGTON—Con.:		
Longview	12,385	10,652
Olympia	13,254	11,733
Port Angeles	9,409	10,188
Puyallup	7,889	7,094
Seattle	368,302	365,583
Spokane	122,001	115,514
Tacoma	109,408	106,817
Vancouver	18,788	15,766
Walla Walla	18,109	15,976
Wenatchee	11,620	11,627
Yakima	27,221	22,101
WEST VIRGINIA:		
Beckley	12,852	9,357
Bluefield[12]	20,641	19,339
Charleston	67,914	60,408
Clarksburg	30,579	28,866
Dunbar	5,266	4,189
Elkins	8,133	7,345
Fairmont	23,105	23,159
Grafton	7,431	7,737
Hinton	5,815	6,654
Hollidays Cove	6,137	4,480
Huntington	78,836	75,572
Keyser	6,177	6,248
Logan	5,166	4,396
Martinsburg	15,063	14,857
Morgantown	16,655	16,186
Moundsville	14,168	14,411
Parkersburg	30,103	29,623
Princeton	7,426	6,955
Richwood	5,051	5,720
South Charleston	10,377	5,904
Welch	6,264	5,376
Wellsburg	6,255	6,398
Weston	8,268	8,646
Wheeling	61,099	61,659
Williamson	8,366	9,410
WISCONSIN:		
Antigo	9,495	8,610
Appleton	28,436	25,267
Ashland	11,101	10,622
Baraboo	6,415	5,545
Beaver Dam	10,356	9,867
Beloit	25,365	23,611
Chippewa Falls	10,368	9,539
Cudahy	10,561	10,631
De Pere	6,373	5,521
Eau Claire	30,745	26,287
Fond du Lac	27,209	26,449
Fort Atkinson	6,153	5,793
Green Bay	46,235	37,415
Janesville	22,992	21,628
Kaukauna	7,382	6,581
Kenosha	48,765	50,262
La Crosse	42,707	39,614
Madison	67,447	57,899
Manitowoc	24,404	22,963
Marinette	14,183	13,734
Marshfield	10,359	8,778
Menasha	10,481	9,062
Menomonie	6,582	5,595
Merrill	8,711	8,458
Milwaukee	587,472	578,249
Monroe	6,182	5,015
Neenah	10,645	9,151
Oconto	5,362	5,030
Oshkosh	39,089	40,108
Portage	7,016	6,308
Racine	67,195	67,542
Rhinelander	8,501	8,019
Rice Lake	5,719	5,177
Shawano	5,565	4,188
Sheboygan	40,638	39,251
Shorewood	15,184	13,479
South Milwaukee	11,134	10,706
Sparta	5,820	4,949
Stevens Point	15,777	13,623
Sturgeon Bay	5,439	4,983
Superior	35,136	36,113
Two Rivers	10,302	10,083
Watertown	11,301	10,613
Waukesha	19,242	17,176
Waupun	6,798	5,768
Wausau	27,268	23,758
Wauwatosa	27,769	21,194
West Allis	36,364	34,671
West Bend	5,452	4,760
West Milwaukee	5,010	4,168
Whitefish Bay	9,651	5,362
Wisconsin Rapids	11,416	8,726
WYOMING:		
Casper	17,964	16,619
Cheyenne	22,474	17,361
Laramie	10,627	8,609
Rawlins	5,531	4,868
Rock Springs	9,827	8,440
Sheridan	10,529	8,536

[1] Population of Texarkana city, Texas, 17,019 in 1940; 16,602 in 1930.
[2] Classified as urban under special rule.
[3] Incorporated since 1930.
[4] The 1930 published figures for Vallejo city, California, corrected by inclusion of Mare Island Naval Reservation (1,596).
[5] South Jacksonville city, Florida, with a 1930 population of 5,597 was annexed to Jacksonville city in 1932.
[6] The 1930 published figures for Evanston city, Illinois, corrected by exclusion of New Trier and Niles townships (218), erroneously returned as in Evanston city in 1930.
[7] The 1930 published figures for Devils Lake city corrected by inclusion of North Dakota School for Deaf and Dumb (68).
[8] The 1930 published figures for Lansdowne borough and for Upper Darby township, Pennsylvania, corrected by transfer of the population (519) of St. Vincent's Home from Lansdowne to Upper Darby. Upper Darby township classified as urban under special rule.
[9] Population of Bristol city, Virginia, 9,768 in 1940; 8,840 in 1930.
[10] Population of Texarkana city, Arkansas, 11,821 in 1940; 10,764 in 1930.
[11] Population of Bristol city, Tennessee, 14,004 in 1940; 12,005 in 1930.
[12] Population of Bluefield town, Virginia, 3,921 in 1940; 3,906 in 1930.

Centennials: *see* CALENDAR, 1941, page xx.

Central America, the region between Mexico and Colombia, embracing the republics of Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, the Panama Canal Zone and the colony of British Honduras. The area is approximately 222,674 sq.mi.; the population approximately 8,356,000 in 1940, is concentrated on the highland plateau adjacent to the Pacific, where from being over 65% Indian in Guatemala, it becomes predominantly mestizo in the middle republics and largely white in Costa Rica. Panama includes a large Negro element of West Indian extraction, while the low Caribbean slope and British Honduras are chiefly negroid. In the republics, government is in practice by dictators, with the outstanding exception of Costa Rica. Dictatorship, however, is of a more enlightened variety than formerly, except in Panama.

The Central American republics were active in inter-American defence efforts during 1940, and participated in the Havana conference despite strong German diplomatic pressure. Politically, the greatest internal problem of the year was suppression of fifth-columnism. Economically, the pinch of European war trade disruption was keenly felt, but the Inter-American Coffee Quota agreement of Nov. 1940, with its promise of coffee price stabilization, and financial aid from the United States materially lessened the tension.

External communication is by sea and by Pan American Airways and Central American Air Transport. Communication between countries is generally poor. Internal communication is by rail, air and highway, and is best developed in El Salvador. Construction of several important links of the Inter-American highway was begun during 1940.

In 1939, Central American imports totalled approximately $89,046,000, and exports $66,214,000, representing increases of 19% and 6% over 1938. Around 50% of all exports went to the United States, which supplied roughly 70% of imports. The United States' share of the foreign trade increased sharply in 1940. Imports are largely foodstuffs, textiles, machinery and other manufactured goods. Coffee from the Pacific uplands and bananas from the lowlands are chief export commodities of most of the republics, with chicle, hemp and logwood the main exports of British Honduras. Gold-mining is of increasing importance, especially in Nicaragua. Corn and beans are grown extensively for domestic consumption. The tourist trade is rapidly expanding in most regions. Education and literacy vary from country to country, with Costa Rica the most advanced. (*See* BRITISH HONDURAS; COSTA RICA; GUATEMALA; HISPANIC AMERICA AND THE EUROPEAN WAR; HONDURAS; NICARAGUA; PANAMA; PANAMA CANAL AND CANAL ZONE; SALVADOR, EL.) (L. W. BE.)

Ceramics: *see* FELDSPAR; GYPSUM.

Cereals. World supplies of the principal bread grain, wheat, stood at record levels in 1940, wartime restrictions on shipments causing scarcity in some countries and unusable surpluses in other countries. Rice, the principal food grain of the orient, presented a similar picture, with pronounced scarcities in Japan and parts of China and mounting surpluses in various producing countries. World production of wheat in the 1940–41 crop year was 6,100,000,000bu. compared to 6,200,000,000bu. in 1939–40 and a five-year (1933–34 to 1937–38) average of 5,500,000,000 bushels. The world acreage of wheat in 1940–41 was 406,600,000ac. compared with 412,600.000ac. in 1939–40 and a five-year average of 397,200,000 acres. The foregoing figures are from the Office of Foreign Agricultural Relations, United States department of agriculture, with incomplete official data supplemented by approximations and with Russian and Chinese production conjectural. Although production in 1940 was slightly under 1939 the large carry-over of about 1,600,000,000bu. resulted in a record. Wheat also is the outstanding example of the greatest change in world-wide agriculture since 1920, practically all wheat-growing countries having greatly expanded production in that time. A large acreage was reported to have been sown to wheat in Europe and the United Kingdom in the autumn of 1940. Official restrictions on agricultural statistics in a number of countries prevent comprehensive reports on production of various food and feed grains, but the International Institute of Agriculture, Rome, gave the acreages planted to rye, barley and oats in various countries in 1940, in 1939 and for the five-year (1934–38) average as shown in the table.

Rye, Barley and Oat Acreage in Certain Countries, 1940, 1939 and Average

Rye Acreage			
Country	1940 Acres	1939 Acres	1934–38 Acres
Greece	163,000	156,000	179,000
Hungary	1,624,000*	1,718,000**	1,558,000†
Luxembourg	16,000	18,000	18,000
Rumania‡	426,000	1,107,000	1,037,000
Sweden	425,000	463,000	539,000
Lithuania, U. S. S. R.¶	1,428,000	1,410,000	1,255,000
Canada	1,035,000	1,102,000	733,000
United States	3,086,000	3,811,000	3,363,000
Argentina§	2,718,000	2,296,000	2,105,000
Barley Acreage			
Country	1940 Acres	1939 Acres	1934–38 Acres
Greece	554,000	532,000	511,000
Hungary	1,300,000*	1,321,000**	1,135,000†
Rumania‡	1,604,000	2,708,000	3,857,000
Lithuania, U. S. S. R.¶	558,000	559,000	521,000
Canada	4,342,000	4,347,000	4,144,000
United States	13,290,000	12,546,000	9,555,000
Egypt	278,000	273,000	280,000
Argentina§	2,056,000	2,122,000	1,975,000
Oats Acreage			
Country	1940 Acres	1939 Acres	1934–38 Acres
Greece	434,000	373,000	339,000
Hungary	793,000*	633,000	542,000
Rumania‡	1,406,000	1,455,000	1,910,000
Lithuania, U. S. S. R.¶	944,000	941,000	858,000
Canada	12,298,000	12,790,000	13,435,000
United States	34,585,000	33,574,000	34,715,000
Argentina§	3,707,000	3,446,000	3,251,000

* Includes reannexed northern zone and sub-Carpathia. ** Includes annexed northern zone but excludes sub-Carpathia. † Territory at end of 1937. ‡ Does not include Bessarabia and northern Bukovina. ¶ Present territory. § 1940–41 crop.

While the supply of feed grains was inadequate in Europe and in the United Kingdom in 1940, the supply in the United States, in comparison with the numbers of livestock to be fed, was the largest on record, chiefly because of the extraordinary carry-over of corn. The corn supply in Argentina also was so large that the grain was used for fuel and experiments were made in an effort to find a market through the manufacture of alcohol. Corn yields in the United States have been increased enormously through the introduction of hybrid varieties, while new varieties of disease-resistant wheat and oats tend to increase acre yields. (For more specific details on cereals *see* WHEAT, RICE, RYE, BARLEY and OATS.) (S. O. R.)

Ceylon. A British crown colony, lying off the southern extremity of India and approaching within 6° of the equator. Area 25,332sq.mi.; pop. (est. Dec. 31, 1938) 5,864,000. Chief towns (pop. census 1931): Colombo (cap., 284,115); Jaffna (45,708); Galle (34,424); Kandy (37,147). Governor, Sir Andrew Caldecott, K.C.M.G.; languages, English, Sinhalese, Tamil; religions, Buddhism and Hinduism the chief.

History.—Ceylon moved toward prosperity in 1939, the visible balance of trade rising from the low level of Rs. 49,000,000 in

1938 to nearly 61,800,000. Difficulties arising from the constitutional position continued, especially in connection with the enfranchisement of immigrant daily-paid labourers from India with no stake in the country. These difficulties led to a request in June 1940 for the appointment of a royal commission of enquiry and were a deciding factor in the postponement (July) for two years of the elections scheduled for Jan. 1941. Labour unrest and communistic agitation also caused trouble, but were not allowed to interfere with the island's contribution to the imperial war effort—this including not only the gift of large sums of money to the various war funds as well as great value in commodities, but also a volunteer corps for air service in any part of the empire and an air base for the royal air force.

Industrial progress was well maintained; food production on a large scale was fostered by subsidy; state rubber, quinine, acetic acid, plywood and other factories were inaugurated; researches for the development of cotton growing and the marine fisheries were instituted and valuable deposits of iron ore found. Progress was made with the civil engineering portion of the Watawala hydroelectric scheme and a labour-training centre for 600 Sinhalese men and women was opened. Serious floods, causing damage to the extent of Rs. 3,000,000, gave an impetus to the various irrigation works recently started to assist agriculture.

On the social side progress was made with the architectural planning of the new Ceylon university at Paradeniya, a suburb of Kandy; a training college for Muslim teachers was founded at Alutgama; and the island's first "Borstal" was opened at Watupitawela.

Education.—In 1939: schools, 6,100, including 336 English schools, 74 bilingual, 3,723 Sinhalese and Tamil (820 estate and 780 unaided); scholars: boys 502,917, girls 325,173.

Banking and Finance.—Revenue (1938–39) Rs. 116,928,463; (est. 1939–40) Rs. 123,484,600; expenditure (1938–39) Rs. 127,050,757; (est. 1939–40) Rs. 129,504,965; public debt (Sept. 30, 1938) Rs. 194,191,333; currency: Rs. 1=100 cents=1*s.*6*d.*

Trade and Communication.—Overseas trade, merchandise, 1939: imports Rs. 242,369,560; exports (domestic) Rs. 304,161,745; re-exports Rs. 22,726,262; exports of tea totalled 228,540,000 lb. (value Rs. 188,000,000) as against 235,670,000 in 1938 (value Rs. 172,400,000). Communications and transport 1938: roads, main surfaced 4,485 mi.; railways (117 mi. narrow gauge), total 960 mi.; shipping, entered 1938, 13,228,439 net tons; motor vehicles licensed (Dec. 31, 1939), 21,014 motor cars and taxis; 4,408 lorries and vans; 2,574 omnibuses; 2,906 cycles; 52 tractors; 210 trailers; wireless receiving set licences (Dec. 31, 1937), 4,911; telephone instruments in use (1938), 10,424.

Agriculture.—Production, 1938 (exports), in metric tons: copra (including coco-nut oil), 197,800; tea, 106,900; rubber, 60,000.

Chain Stores.

The sales volumes of the corporate chain store for the first eleven months of 1940 and for the first two weeks in December show that during 1940 the corporate chain maintained its competitive position in retailing and in some cases improved it. Sales for the year were about 10% ahead of 1939 in the food field, 6% ahead in the drug field and 5% ahead in the variety store field. Reliable estimates indicated that the grocery chains accounted for better than 40% of the total grocery volume while operating fewer stores than at any time since 1930, and that the drug chains accounted for about 25% of the total drug store volume while operating less than 10% of the total number of drug stores. Volume gains were general among practically all types of corporate chains and were widespread geographically. Net profits, for the most part, were better than expected in view of increased operating costs and higher taxes.

From the point of view of the corporate chain, the most significant development of 1940 on the legislative front was the public hearing on H.R. 1, the so-called Patman "death sentence" anti-chain tax measure. Frankly designed through its drastic and graduated excise tax provisions to cripple or destroy every corporate chain operating numerous units in many states, to damage every corporate chain operating a few stores in each of many states, and to affect harmfully every corporate chain operating numerous units in one state, this bill was introduced in 1938 by Representative Patman as H.R. 9464. In 1939 it became H.R. 1 and continued to be lodged in the ways and means committee of the house. At the insistence of its sponsor, public hearings were granted to H.R. 1 and were conducted before a seven-man subcommittee from March 27 through May 16, 1940. The case for the bill was presented by a small group of 26 proponent witnesses, almost all of whom were either wholesalers or retailers or their spokesmen. In contrast, the bill was opposed by 162 witnesses from 35 states representing important groups from the fields of agriculture, labour, real-estate ownership, home economics and the federal departments of agriculture and of commerce. As a result of the mass of testimony condemning the principle of the bill and affirming the economic and social value of the corporate chain system of retailing, the house subcommittee, on June 18, defeated a motion to report the bill favourably to the ways and means committee and adjourned *sine die,* but made available a printed record of 2,257 pages of testimony.

During 1940, 10 discriminatory chain tax measures were sponsored in four state legislatures and in the District of Columbia. However, 1940 maintained the record of the previous two years and no new state was added to the list of 20 that since 1937 have had anti-chain store tax laws on their statute books. Two states, Kentucky and Mississippi, passed new chain tax measures superseding previous impositions. Both were of the so-called "Louisiana type." Kentucky's 1940 law is that commonwealth's fourth attempt to place on its statute books a law which will be acceptable to its highest court, inasmuch as three previous anti-chain measures have been invalidated. On March 25, the supreme court of the United States remanded to the supreme court of Minnesota for review the state court's decision in the so-called National Tea company case and on Sept. 27 the state supreme court again held unconstitutional the graduated gross receipts tax provisions of the 1933 Minnesota Chain Store Tax law. In 1940, as in 1939, court decisions tended to consider economic as well as legalistic grounds and to hold anti-chain tax measures unwarrantably discriminatory in their economic basis.

As of Dec. 1, 1940, 28 municipalities in the United States—all but one (Portland, Ore.) located south of the Mason and Dixon line—had punitive chain store tax ordinances in force. Nine of the 28 municipalities passed these ordinances in 1940. Such ordinances, however, continued to meet with court rebuffs. Early in the year, the Georgia supreme court invalidated the Augusta, Ga., chain tax ordinance. On Aug. 27, for the second time within two years, the Columbus, Ga., ordinance was held to be "confiscatory, discriminatory, arbitrary and therefore unreasonable" by the Georgia courts.

The year 1940 also indicated a further judicial trend toward the application of operative chain store tax provisions to "voluntary" and "co-operative" chains. On June 12, the 3rd Judicial district court of Idaho held that individually owned stores associated in a voluntary group are subject to the Idaho chain store tax. On May 9, the South Dakota circuit court also held that individually incorporated stores subject to common direction in buying and other phases of management and operation are taxable under that state's chain store statute. And while the anti-chain store tax law of Texas exempts filling stations, the Texas

court of civil appeals, late in 1940, held that a chain of Texas filling stations was subject to such taxes because a number of general merchandise items were being sold in addition to the petroleum products.

In part, at least, because of this extension of chain tax laws to "voluntaries," one large oil company announced its decision to resume the operation of company-owned service stations. Indications were growing that there would be a continued movement away from the "Iowa plan," so-called because the Standard Oil Company of Indiana began to organize its Iowa filling stations on a "voluntary" basis in 1935, immediately after that state passed a corporate chain tax measure that hit directly at company-owned filling stations.

The corporate chain continued to establish supermarkets and large self-service units and to close small, unprofitable units. Twenty-six of the largest corporate chains operated about 7% fewer units in 1940 than in 1939.

In 1940 the ratio of independents to corporate store units was about 9 to 1 as against a ratio of 5 to 1 in 1929. In September the Super-market institute announced that approximately 7,500 supermarkets were in existence, representing an increase of about 40% over Sept. 1939.

During the year, the food chains sharply increased the use of the self-service principle in their produce departments. They continued to "dress-up" the self-service idea and spent about $29,300,000 on store construction and modernization as compared with a total of about $28,000,000 in 1939. For all corporate chains, such expenditures increased about 3.2% over the construction and modernization figures for 1939.

The corporate chains, particularly in the food field, continued to expand their lines with a resulting slowing down in the rate of stock turnover. However, volumes were maintained and increased in part, at least, by the energetic development and promotion of chain store brands. The Great Atlantic and Pacific chain, for example, added about 20 lines to its own label list in the years 1937–40 and did about 25% of its total volume in its own labels, an increase of 15% to 20% over the same period.

The merchandising management of the corporates during 1940 continued to experiment and to keep in a flexible position with a watchful eye on competition. Woolworths, for the first time, issued a merchandise catalogue for its holiday season. One variety chain announced serious consideration of credit sales. Several drug chains began to re-emphasize the professional side of drug retailing. One of the largest food corporates decided to eliminate direct deliveries by manufacturers to its unit stores and announced that the resulting savings to the manufacturer should be passed on to the chain in lower prices and already many manufacturers have adjusted their prices to this chain accordingly. By and large, new ideas and new methods were approached without timidity.

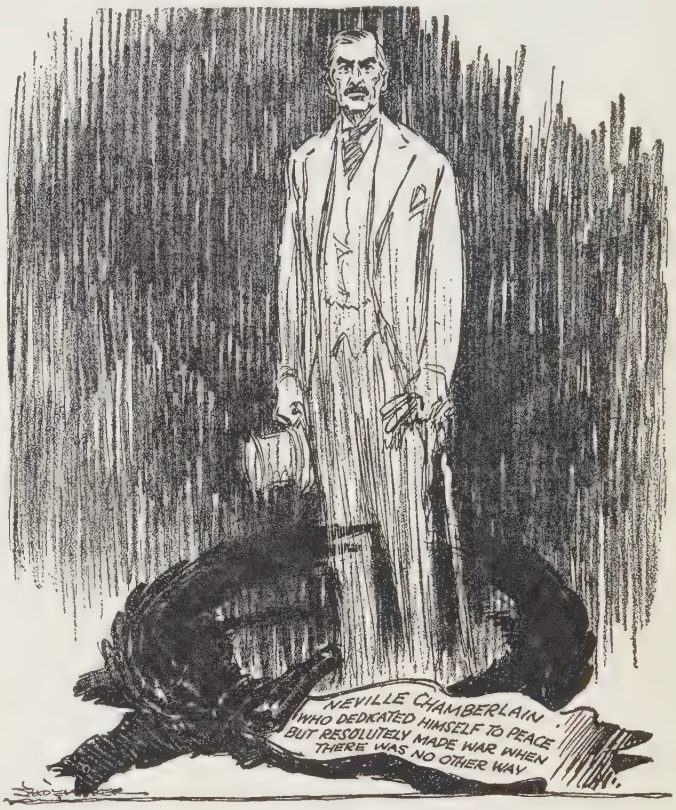
Active chain store co-operation with the farmer continued. Producer-consumer drives, designed to distribute surplus crops and to bolster shaky markets, promoted the movement of farm commodities by store displays, co-ordinated advertising campaigns and special educational programs.

Chain store co-operation with the consumer movement on a closer basis than ever before was also characteristic of 1940. The food chains, in particular, led in experiments in grade-labelling, one of the long-term goals of consumer organizations.

On the labour front, the corporates experienced a few serious strikes during 1940 but, in the main, improved their labour relations and were increasingly experimenting with the use of trained labour relations experts and planned industrial relations programs. (*See* also LAW [CASE]: *Trade Regulation;* RETAIL SALES.)

(G. R. C.)

Chamberlain, Arthur Neville (1869–1940), British statesman, was born March 18. For an account of his career prior to his appointment as prime minister in 1937 see *Encyclopædia Britannica,* vol. 5, p. 201. As prime minister he was confronted with the task of meeting the growing menace of Germany to the peace of Europe. His policy of conciliation culminated in the pact of Munich in 1938, which he declared guaranteed "peace in our time." Great



"CIVILIZATION MOURNS." A tribute to Neville Chamberlain, by Shoemaker of the *Chicago Daily News*

Britain and France had pledged their support to Poland if attacked, and when Germany made war on Poland Great Britain and France declared war against Germany. He was succeeded as prime minister by Winston Churchill May 10, 1940, and gradually withdrew from all political activity. He died at his country estate, Heckfield house, Odiham, Hampshire, on Nov. 9.

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Chambers of Commerce. While normal business volume was appreciably larger in the United States during the first half of 1940, the national defence program inaugurated by the United States government in mid-year provided an impetus which resulted in greatly increased industrial output for the year. United States business and industry responded promptly to the requirements of the defence program. Chambers of Commerce and trade associations adapted themselves to the situation, offering many services which aided industrial mobilization. They also gave increased attention to taxation, public expenditures, governmental regulation and other national issues, particularly as related to defence.

The Chamber of Commerce of the United States, a federation comprising 1,600 Chambers of Commerce and trade and industrial associations with membership of over 600,000 business men, continued its program designed to create a wider public knowledge of the underlying functions and motives of business. It inter-

preted the economic and social aspects of the national defence program and stressed the need for effectuating it within the confines of the U.S. system of private initiative.

Chambers of Commerce in Europe were called upon for a wide variety of additional services resulting from the interruption of normal export and import trade channels by war blockades and restrictive regulations. In the belligerent countries trade and industrial organizations were marshalled into offensive and defensive war efforts. The trade trend in strategic and critical war materials was of special concern to many organizations.

(J. S. Ke.)

Channel Islands: *see* British Empire.

Cheese. Production of cheese in the U.S. in 1940 reached a new all-time high, estimated by the department of agriculture as 658,200,000lb., a 9% increase over the 1939 output of 533,386,000 pounds. Unique in the factors contributing to the increased production was the sharp decline in imports of European cheese in the first six months of 1940, owing to the European war, and, after the surrender of France to Germany, the almost complete cessation of U.S. imports of cheese from Europe. This development immediately opened up a market in the U.S. for South American cheese manufacturers, and in 1940, for the first time in history, the U.S. imported large quantities of cheese from South America, some from Brazil, but mostly from Argentina. As a result cheese imports into the U.S. were not greatly affected by the cutting off of European shipments.

For the first nine months in 1940 U.S. imports of cheese were 26,193,638lb. compared to 37,612,750lb. in the same period in 1939. With the exception of the famous French blue-mould cheese (Roquefort), U.S. cheese manufacturers reproduce all the better known European cheeses, including Camembert, Limburger, Gorgonzola, Bel Paese. U.S. production of a number of European-types of cheese increased 50 to 75% in 1940. South American manufacturers also duplicate favourite European cheeses and ship to the U.S. Roquefort cheese is made of sheep's milk, of which there is not a commercial supply in the U.S., and, therefore, blue-mould cheese made in this country is manufactured from cow's milk, as in South America. In October the French producers of Roquefort cheese (the Société Anonyme des Caves et des Producteurs Réunis de Roquefort) obtained an injunction in the New York state supreme court against three Argentine cheese manufacturers and their New York agents forbidding them to label and package Argentine blue-mould cheese in a manner similar to that of Roquefort. Exports of U.S. cheese, processed cheese and spreads advanced in 1940 over 1939. For the first nine months of 1940 exports of cheese were 399,063lb. compared to 387,617lb. during the same period in 1939. Exports of processed cheese and cheese spreads the first nine months in 1940 were 1,120,031lb. compared to 725,254lb. in the same months in 1939. The average retail price for cheese in the U.S. in 1940 was 25·8 cents per lb. compared to 25·3 cents per lb. in 1939. Average prices paid Wisconsin farmers for 10·43lb. of milk in 1940 was 13·1 cents compared to 12·1 cents in 1939. Cheese production in the U.S. increased 39% in the 1930–39 period. (*See* also Dairying; Milk.)

(S. O. R.)

Chemical Warfare. The dearth of official information with reference to the use or development of chemical agents and equipment during the European War which began in 1939, necessitates increased reliance on newspapers, magazines and radio commentators. Sources of information may have been excellent, but insofar as chemical warfare developments of 1940 were concerned, the news was not confirmed by official study and pronouncement.

Two facts of outstanding interest, nevertheless, marked the year 1940. First was failure to employ toxic chemicals in military campaigns or in aerial attacks on cities. Second was the unabated energy with which measures for protection against gas warfare were carried forward.

Undoubtedly these two facts bear a direct relationship to each other. Had anti-gas defence been lacking, it is most probable that the defenceless state would have been subjected to gas attack. The fact that protective measures were maintained and reinforced during the year explains in part, although not wholly, why resort was not had to gas warfare in connection with the intensive military operations of 1940. France and Great Britain, it would appear, were unready for an "all out" offensive use of toxic chemicals. If this was so, they had more to lose than to gain by initiating gas warfare.

Germany's failure to use toxic chemicals in the Low Countries and in Northern France may be ascribed to the same reason which caused her to omit such weapons during the Polish campaign of 1939. Again it was a one-sided struggle in which a more powerful force, by the very vigour of its attack, quickly overwhelmed its adversaries. The rapidity of advance made the use of chemicals unnecessary. On the other hand, employment of persistent chemicals of the mustard gas type could easily have been detrimental to an advance over a broad front.

Less clear are reasons for non-use of toxic chemicals in bombing raids, especially in view of the unhesitating German policy to utilize every advantageous means to victory. It may be assumed that Germany possessed ample resources for attacking England with gas. The threat of retaliation, however, continued ever-present as long as the royal air force could not be prevented from reaching populous German cities.

The gas mask as an item of individual equipment is normal to all modern armies, but the need for protection of the civil population did not become apparent until the development of long-range bombing planes made it clear that targets were no longer confined to the forward areas of the battle zone. As early as 1921 certain foreign military writers began to stress the importance of concentrated attacks by long-range bombers upon cities, manufacturing, supply or transportation centres far behind the battle front. Such attacks could be made by chemical bombs and spray, as well as by high explosive and incendiary bombs. Preparations were needed to meet this new and dangerous threat to the heart of an army—the civilian population at home. Long before the outbreak of the war in 1939, the leading nations of Europe were devoting considerable money, technical skill and manufacturing effort toward adequate passive defence measures for the civilian. These included the provision of a gas mask for every citizen, gas and bombproof enclosures and thorough education of the public in protection against chemicals. These air raid precautions were best achieved in Great Britain, and the relatively small loss of life in bombing raids on British cities during 1940 may be credited to thoroughness of that system. The fact that the British public was well prepared for defence against gas undoubtedly was added insurance against such an attack.

A rapid and effective development in chemical warfare took place during the three years immediately following its introduction in 1915. Nations have been at least reluctant to divulge developments since that period, but it is common knowledge that chemical science and industry have made tremendous forward strides. Consequently the average layman was ready to believe that similar progress had been made in war chemicals and to accept at face value boasts of a secret weapon as some new all-powerful, devastating gas against which available protection was useless. Nerve and paralyzant gases had been so frequently

mentioned in press accounts that for a few days during May 1940 the surrender of the Belgian fort Eben Emael with its garrison of 1,000 men to a squad of Germans was ascribed to an attack by a mysterious paralyzant gas.

Chemical Offence.—The chief chemical warfare agents used during 1940 were screening smokes and incendiaries. Screening smoke tactics were effectively employed in both land and sea battles. Smoke units, armed with medium calibre rapid firing mortars, were available to the Germans. The principal mission of these troops was to fire smoke; but they were undoubtedly able to fire other chemicals with the same equipment. Germany utilized smoke tactics with exceptional efficiency to blind observation, eliminate enemy aimed fire and to immobilize enemy movements within smoke. These tactics were especially effective during the closing weeks of the campaign in France to facilitate river crossings, to establish bridge heads and to assist the rapid advance of infantry and tanks. At sea both sides used screening smoke to seek concealment from aimed fire or to escape a superior foe.

The Germans, according to news accounts, also used flame throwers mounted on tanks against personnel in concrete pill boxes and tanks. Incendiary bombs in tremendous numbers and of varying size and composition were used during the latter half of the year by Germany, Italy and Great Britain. These were generally used in conjunction with attack by high explosive bombs and devastating results were frequently achieved. Incendiary bombs were usually of the thermit type or of electron metal. The thermits are mixtures of powdered aluminium and iron oxide which react chemically and generate intense heat. Electron bombs are used principally in small scatter type bombs and have a case of magnesium alloy which is ignited by a chemical mixture and burns with intense heat. Since the quantity delivered depended entirely on carrying capacity, Germany's much more numerous air force delivered a much larger number of bombs with greater incendiary effect than that of Great Britain. In addition to normal incendiary bombs, Great Britain used a novel incendiary in the form of self-igniting leaves. These were said to consist of a thin layer of a cellulose compound, behind which was specially prepared phosphorus on a small sheet of thin cardboard.

The trend of development continued toward more effective chemical and incendiary bombs and spray apparatus for dissemination of chemicals from the air. There was a constant effort to secure increased range in ground weapons. Self-propelled track-laying chemical tanks have been developed for use as mobile ground-spraying apparatus, or to discharge cylinders of gas on or near an enemy line. No information is available on new chemicals for war use. It appears that modification of types known or more efficient methods of dispersion will first appear, rather than entirely new discoveries.

Chemical Defence.—Continued improvements as to fit, comfort and effectiveness of gas masks have been made. The canister has become more compact and efficient by improvements in its chemical content of charcoal and soda lime for neutralization of war chemicals. In addition, more efficient types of filters have been developed to remove minute particles of irritant smoke. Effective filtration of these particles has always been a serious problem. Air purifiers for gas-proof shelters operate like giant gas mask canisters through which the air is pumped into the enclosure. Mustard-proof clothing and methods of decontamination have been improved.

In the United States efforts continued toward providing adequate protection to its army.

Careful study of reports from the warring countries indicates excellent means of protection against gas—far better than are possible against high explosives. Any relaxation in provisions for protection against gas might be a signal for the use of gas against the civil population. Gas, if effectively used with high explosive, might be the psychological means of weakening the will to resist.

(Ha. Sh.)

Chemistry. In 1940 in the field of chemistry literally thousands of new research contributions have appeared. A few of the more interesting topics of the year will be presented in sufficient detail to outline their significance.

Synthetic Optical Crystals.—Modern advances in ultraviolet and infrared spectroscopy have developed the need for crystals of larger size than those found in nature. Glass prisms are satisfactory for the visible range but penetrate only slightly into the ultraviolet or infrared. Prisms of lithium fluoride are valuable in ultraviolet spectroscopy and prisms of sodium chloride (rock salt) have long been popular for work in the infrared region. H. C. Kremers of the Harshaw Chemical company reported a satisfactory method of growing these and other optical crystals. Synthetic sodium chloride crystals 8in. in diameter and weighing as much as 25lb. may be grown. Briefly, the method is as follows:

A platinum cylinder is filled with the desired salt which is melted in an electrically heated tube furnace. A diaphragm separates this furnace from a second furnace which is maintained below the fusion temperature of the salt. The crucible then is lowered very gradually—a matter of days—through the diaphragm and continuous crystallization occurs at the diaphragm. To anneal the crystals they are held for a week at a temperature of about 50° below the temperature of fusion.

Marijuana.—Hemp fibre has long been used for rope and clothing. Hemp seeds have been pressed for oil. The hemp plant also produces "marijuana," a term that includes any part of the plant (genus, *Cannabis*) or extract therefrom which brings about intoxication in man. In 1940 Adams and collaborators at the University of Illinois isolated and determined the structure of the active substance in the plant.

Between the period when the female plant (*Cannabis indica*) is about to flower and until the seeds are mature, the hairy tops contain a sticky resin. Some resin is obtainable also from the male plant but in much smaller quantity. The resin contains the intoxicating principle of the plant. Plants grown in hot dry climates such as Chinese Turkestan produce much more resin than those grown in moist, temperate climates.

The resin of the hemp plant itself may be extracted with light petroleum. From the red oil thus obtained two compounds called cannabidiol and cannabinol have been isolated. These account for three-fifths of the oil but explain none of its activity since they are inert physiologically. The other two-fifths probably contains tetra- and hexahydrocannabinols which have demonstrated potency.

Chemically, it has been established that cannabidiol is a substituted biphenyl. One of these phenyl groups has a pentyl radical in position 4 and phenolic hydroxyls in positions 2, 6. The other phenyl group is really tetrahydrophenyl and it is substituted by α-methylvinyl in position 2 and methyl in position 5. The two phenolic functions explain the suffix "diol" in the name cannabidiol. This compound, as mentioned above, is inactive physiologically, but on treatment with acidic reagents it isomerizes smoothly to a new substance, tetrahydrocannabinol, which has very high marijuana activity. All that happens chemically in this change is addition of one of the phenolic hydroxyls to the methylvinyl group, thereby forming a new 6-membered oxygen-containing ring which is shared jointly by the two pre-existing phenyl rings.

Cannabinol resembles tetrahydrocannabinol structurally but not physiologically. Loss of the four hydrogens brings about loss of the marijuana activity. Adams demonstrated the dehydrogenation of tetrahydrocannabinol to cannabinol in laboratory experi-

ments and suggested that reactions in the hemp plant might be similar.

Synthetic Rubber.—The year 1940 witnessed a remarkable development in the technology of rubber-like materials. Rubber itself is a hydrocarbon, the molecules of which are of gigantic size compared with molecules of simple hydrocarbons such as pentane, acetylene, benzene or naphthalene. In spite of its vast size, consideration of the structure of the rubber molecule reveals a simple pattern. It is merely a collection of about 2,000 small methylbutadiene or isoprene molecules joined end to end.

Experimentally, one may convert methylbutadiene, a low boiling liquid, into rubber by leaving it in contact with metallic sodium. No convenient source of methylbutadiene is known, however, so the method is impractical.

Butadiene and chlorobutadiene do have convenient sources so they provide good starting materials in the synthesis of rubber-like products. Both may be made from vinylacetylene (C_4H_4) which, in turn, is made by causing acetylene (C_2H_2) to double up with itself in the presence of copper salts. Addition of hydrogen chloride yields chlorobutadiene (C_4H_5Cl), whereas insertion of hydrogen yields butadiene (C_4H_6). Butadiene may be made also by catalytic subtraction of hydrogen from butane (C_4H_{10}) or butene (C_4H_8), but these are available only in petroleum-bearing countries.

The "rubber" made from chlorobutadiene has been marketed in the United States since 1932 under the name of neoprene. The buna rubbers, which have been developed considerably in Germany, are even newer. Their manufacture involves butadiene and another unsaturated substance. Buna-S incorporates butadiene and styrene. Buna-N and perbunan are made by the co-polymerization of butadiene and acrylonitrile (vinyl cyanide). Buna-N and neoprene resist the swelling action of gasoline far better than ordinary rubber does. Buna-S possesses better heat resistance and abrasion resistance than rubber itself. It is noteworthy that these desirable properties arise from the introduction of some other unit to participate in a "cross-polymerization" with the butadiene.

Another butadiene development of 1940 was announced by W. L. Semon of Goodrich Rubber Co. A co-polymer named ameripol is made from butadiene and another material (not revealed as yet) made from natural gas and air. It is made into a milky emulsion with soap. When heated the ingredients react to form a liquid similar in appearance to rubber latex and similar also in the manner of processing. Ameripol is said to be used already in tire manufacture.

"Butyl rubber" is another achievement. It was announced by Frolich and co-workers of the Standard Oil Development Co. (N.J.). As before, butadiene is used but not as the chief ingredient. Essentially this rubber-like material is made by polymerizing olefins. Only a small amount of butadiene (a diolefin) is added. As a matter of fact the olefin gas isobutylene may be polymerized without butadiene to yield a "polyisobutylene" which is rubber-like because the molecules in the polymer consist of 500 to 5,000 isobutylene units. This polyisobutylene is essentially a saturated hydrocarbon, inert toward ozone, nitric acid, sulphur and hence incapable of vulcanization. If just enough butadiene gas is mixed with the original isobutylene gas to provide for sufficient unsaturation in the polymerized mass so that it can be vulcanized, the resulting product is "butyl rubber." When cured, it is devoid of unsaturation and is as inert chemically as the polyisobutylene. It is more stretchable, however, than the rubber from trees.

Isobutylene is a gas produced during the cracking of petroleum. It may be prepared also by pyrolysis of isobutane, an important ingredient of natural gas. Normal butane, also in natural gas, may be rearranged into isobutane by appropriate catalysts at high temperatures and in the presence of other catalysts it may b changed by dehydrogenation into butadiene. Therefore, natura gas and petroleum become the raw materials for this new syn thesis of rubber.

Atomic Disruptions.—Much information about radioactivit has been collected since the discovery of radium by Pierre an Marie Curie in 1898. The cause of radioactivity was stated b Rutherford and Soddy in 1902 to be spontaneous atomic disin tegration with the attendant emission of energy in the form c rays or particles. A decade passed before Rutherford made h fundamentally important conjecture of the existence of the nu cleus of the atom. Rutherford again in 1919 demonstrated tha the nucleus could be disrupted artificially by bombardment wit high-speed helium nuclei or "alpha particles" from natural radio active sources. The alpha particle may be regarded as a high speed bullet designed to pierce the nucleus of the target atom s as to knock out one or more of its constituent particles. In 193 Cockcroft and Walton learned how to impart sufficient spee artificially to a hydrogen nucleus so that the latter could brin about atomic disintegrations without help from radioactiv sources. Their method was to accelerate the hydrogen nucleus t a bombarding speed in a high voltage field obtained by the us of electrical transformers. Shortly thereafter, this method wa modified and greatly improved by Lawrence's cyclotron. In th way over 700 atomic transformations have been studied an nearly half of these have produced radioactive atomic specie From 1936 to 1940 more artificial radioactive species have bee produced and identified than were previously known of the na ural variety.

Hevesy's work in biochemical experiments with radioactiv phosphorus is but one of many important applications which hav come to the front since the advent of artificial radioactivity. I red phosphorus (atomic weight 31) is treated with accelerate deuterons (the nucleus of "heavy hydrogen") from a cyclotro then a supply of radioactive phosphorus is produced, the latte having an atomic weight of 32 and a half-life period of two week When changed to a phosphate and administered in various orga of an animal its transformations in the body can be followe closely. In this way, for example, it has been shown that almo immediately after the introduction of active phosphate into th blood stream a large part of the P^{32} is to be found in the skel ton. The role of phospholipids in fat metabolism is another c the many problems which have been attacked by this method.

Bombardment with fast moving particles is not the only art ficial means of disrupting atoms. Fermi showed that bombard ment with either fast moving or slow moving neutrons (particle with no charge) would cause breakdown. Until 1940 no one ha suggested that an atomic nucleus under bombardment might spl into two approximately equal parts, and the helium nucleus wa the heaviest particle previously known to be severed from an atom. It has been shown, however, that when slow neutrons ent the nucleus of certain uranium or thorium atoms, notably uraniu of atomic weight 235, there is subsequent splitting into pairs c fragments with the emission of three high-speed neutrons t gether with electrons or beta particles for each entering slov speed neutron. This tremendous increase in emitted energy ha led to much speculation as to the possibility of harnessin uranium 235 as a source of power. According to S. C. Lind it estimated that about 80,000lb. of uranium is associated with th annual production of 10 grams of radium. Most of this uraniu to be sure, is of the 238 variety but about 570lb. of it represe the 235-isotope. Since only 5lb. of the latter would suffice for large power production, it is evident that the natural source large enough to be very important if later work shows that th isotope can be separated. No acceptable method for this separ

.on is known, however, and until one is conceived it seems use-ess to anticipate the advent of atomic power. The story com-rises part of one of the most fascinating chapters of chemistry, hether or not this type of energy ever becomes harnessed.

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hemistry, Applied. Advances in industrial chemistry have been made in all important elds. To compete with metal and fibre as containers, is a stronger ass, "Duraglass," which when in a new design provides a lighter eight bottle, cheap enough for single service. A new thin glass rick, "Thermopane," and a hollow glass brick containing a gas at becomes luminous when an electric current passes through it e innovations for the building industry. Further progress was ade in effecting glass capable of greater light transmission by a itable chemical treatment of the surface, such as with 1% nitric id solution to form low refractive index surface films. When is process is followed by a baking operation the glass sur-ce is made much more durable. As for invisible films on glass reduce light lost by reflections, evaporated films of magnesium oride can be hardened by heat treatment and the effective rdness can be further increased by the application of oil or ap as a lubricant and waterproofing agent. The non-reflecting rface glass announced in 1939 was being commercialized in 940. Improvements were made in the process of producing irrors, using a continuous spraying method. A laminated glass nsisting of one sheet high in its content of lead oxide between vo thin protective sheets was developed as a guard against -rays.

New laboratories for research on powdered metals were estab-shed. Nails were finished in colour to match coloured wallboard, nd a process utilizing a special type of electric arc furnace to pro-ce single ingots of two or more compositions integrally bonded gether called "Pluramelt" was perfected. Accomplishments may e recorded in the effort to produce aluminium from clay and a rge plant was erected in Texas for the separation of the lightest etal, magnesium, from sea water.

The rare metal, polonium, was used in the electrodes of spark lugs. Indium became a metal of commercial importance and a agnetic alloy of cobalt, vanadium and iron that can be drawn nd rolled was introduced. An alloy of copper and silicon to take e place of copper-tin bronzes was announced and is of some nportance in the effort to conserve tin. Cable sheathing, ordi-arily made of a lead-antimony alloy, can be produced with cal-um as a substitute for the antimony, with entirely satisfactory esults. Here, again, the elimination of an imported material, ntimony, is noteworthy.

Potassium hydroxide, potassium chlorate and potassium cyanide re now manufactured in the United States. Thiodiglycol was nthesized from ethylene oxide and hydrogen sulphide. A plant r the synthesis of phenol by a new process was completed after ur years of research and development and a plant was author-ed by federal authority for the manufacture of toluene from etroleum gases. A process for the synthesis of glycerine which ad been proved on a small scale entered the semicommercial age with a production of a ton a day. A considerable number of ew organic dyes was announced during the year, as was a new roup of calcium silicate pigments.

Further progress was made in preparing further derivatives rom sulphanilamide to reduce toxicity, make possible the use of maller doses, and perfect compounds especially applicable to ertain types of infection. One of the vitamins was found effica-cious in overcoming keratitis, an infection of the eyes, and the presence of important vitamins in grass, which may be dried for incorporation in powdered form in certain feeds and foods, was announced. Riboflavin or vitamin B_2 was produced on a commercial scale at costs low enough to enable its use in feeds as well as foods as a reinforcing nutrition agent. The vitamins thus become available through the grocery as well as through the pharmacy.

After having studied 135 treatments for the prevention of mildew, the department of agriculture found the cadmium chloride process one of the simplest. Grapefruit seed oil after sulphonation is used as an assistant in textile dyeing. Casein fibre obtained from skim milk was used as a blend with rabbit fur to make high grade hat felt. A new fibre from the protein of soybeans was produced for use with wool and mohair for automobile upholstery. Dots and similar patterns on fabrics were obtained by the use of an electrostatic field, producing unusual patterns with far better wearing qualities than those heretofore available. Advances in mothproofing include treatment of wool with an alkylene oxide, imine or sulphide in which the reagent is chemically bonded to the wool. A new method of manufacturing coloured filaments incorporated the dyestuff or dyestuff components in the coagulating bath, so that the colouring was accomplished simultaneously with the formation of the fibre itself.

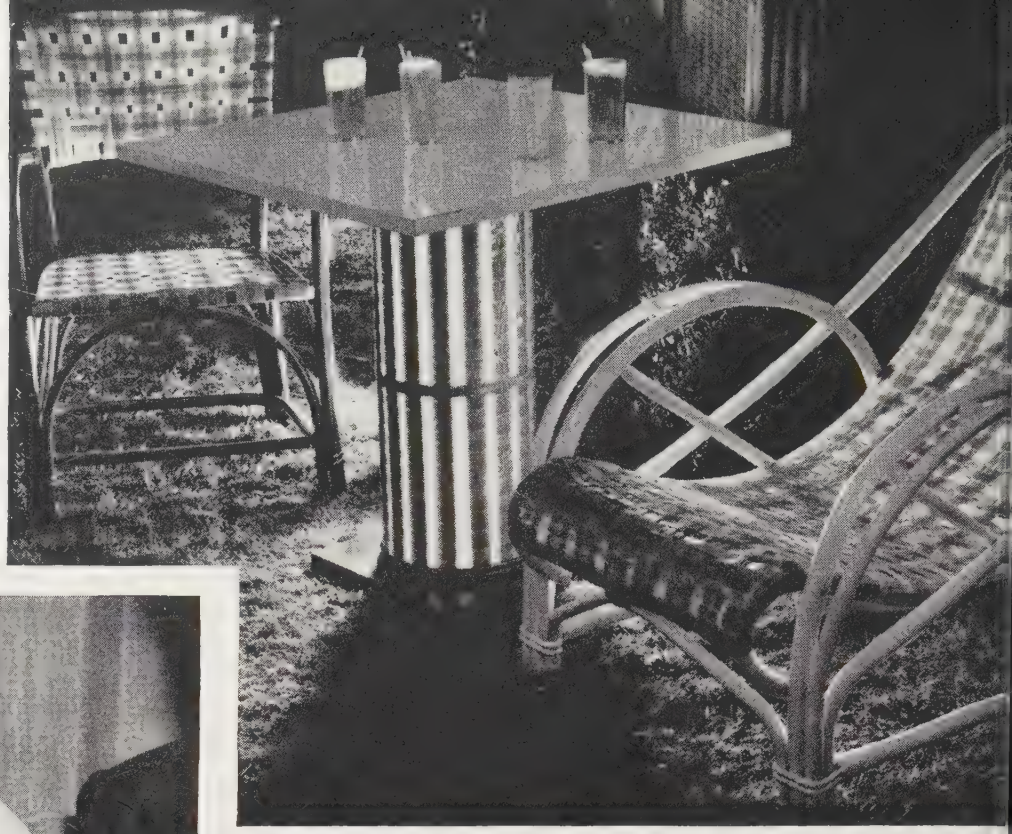
Nylon, a synthetic fibre, was introduced commercially and a large expansion of facilities for the production of this fibre was planned. Meanwhile ways were found to make the new fibre especially resistant to acids and alkalies, to crimp the fibres mechanically to give many of the properties of wool, to preshrink nylon and to use it in coating paper. Its use as a bristle for various types of brushes was greatly expanded.

Spectacular have been the advances in synthetic rubber-like plastics or elastomers. Improvements in neoprene and Thiokol include the elimination of objectionable odour. Koroseal found new applications, and rights for the manufacture of the various Bunas in the United States were secured. Butyl rubber, Ameripol and Chemigum were newcomers derived from petroleum and already in small-scale commercial production. Tires produced from such American materials were on sale, and the world situation made advisable plans for large-scale production as soon as plants can be erected. New uses for rubber and the introduction of these synthetics in places where natural rubber is unsatisfactory added to the importance of such compounds in modern industry.

The plastics saw additions to their already long list. "Melamac," a melamine resin, was produced for coating and laminating purposes; polyvinylidene plastics under the name "Saran" made their bow and were seen by the public in use to supplant rattan, as addition to leaders, lines, and other fishing equipment, to mention but a few applications, and calendered vinylite sheets were introduced. Among the new uses should be mentioned costume jewellery, laminated building board of great size (up to 8x20ft.), containers formed like pasteboard boxes, ladies' shoes, furniture and football helmets. An improved pencil was made by depositing on the leads a surface coating to which glue adheres well, thus virtually welding the lead and wood into an inseparable unit.

"Self-heating" canned goods were introduced in the food industry. When a false bottom is penetrated, air combines with chemicals in a compartment to warm the contents of the can. It was found that a tiny quantity of gum guaiac will prevent the oxidation of lard, that a little calcium chloride will enable canned tomatoes to retain their shape, and that manganese is an important item in feed for turkeys. New paints reflect as much as 72% of ultraviolet light from health lamps and progress was made in developing paints of germicidal value. New chemical methods made available new species for paper pulp, and sodium

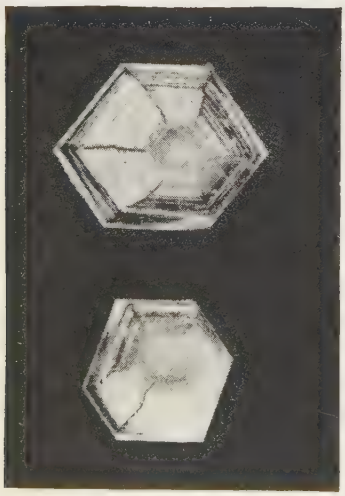
CRYSTALS of the very rare sugar, ribose, believed to be the most widely distributed sugar in plant and animal life (magnification, 100 diameters). It was available for research in 1940 because of the U.S. bureau of standard's new method of production which reduces cost to approximately $2.00 per gram



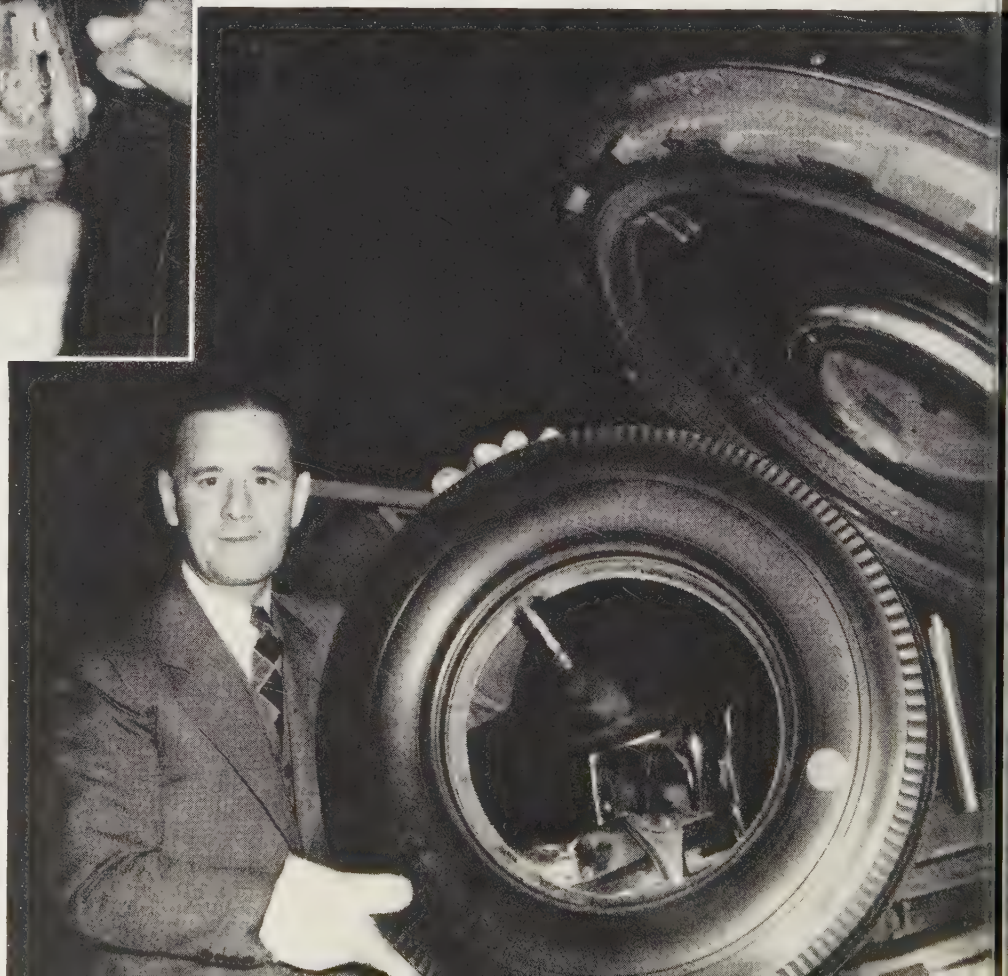
CHAIRS AND TABLE of translucent tenite on display at an exhibition of plastics in 194

Left: "AMERIPOL," a new artificial rubber, is made entirely from materials available in t United States

Below: THE FIRST U.S. TIRE manufactured of synthetic rubber was displayed at New Yo city in 1940



DOMESTIC PRODUCTION OF THIOUREA was begun in the United States in 1940 to supplement or replace foreign sources of supply. This is an important chemical used in photography and in the



lorite was manufactured on a large scale for bleaching more tisfactorily some pulps used in paper manufacture. (*See* also HEMISTRY AND ENGINEERING, AGRICULTURAL; U.S. BUREAU OF; HEMURGY; INDUSTRIAL RESEARCH; PLASTICS INDUSTRY; VITAINS.) (H. E. H.)

hemistry and Engineering, Agricultural, . S. Bureau of.

This bureau conducts chemical and technological research on agricultural prodts, studies farm machinery and its use, mechanical processing cotton and flax, construction of farm buildings and the use of ectricity in agriculture and recently has expanded its studies degned to increase the use of farm commodities in industry. For rrying on this work on industrial utilization of farm crops, the ureau finished and was equipping four regional laboratories proded for by the congress in 1938. These laboratories are at eoria, Ill., New Orleans, La., Philadelphia, Pa. and San Francisco, alif. Active research was expected to begin in at least three of em early in 1941.

Some of the chief results of the bureau's research during the 940 fiscal year are listed here:

Special mechanical equipment and an economical procedure ere devised for use in the preparation of soybean sprouts.

New fruit products developed in collaborative work included invidually frozen apple slices for pies, frozen fruit purees for ice eam and sherbets, dehydrated sugared strawberries, clarified rawberry juice, butter and candied pomace from strawberry ulp, fresh prune beverage, fruit-and-milk beverages and improved acked juices of several fruits.

Hesperidin, the glucoside in orange peel, was found to be nonoxic. Cadmium compounds were found to have a toxic effect like at of fluorine compounds; both produce mottling of teeth and hibit the action of the enzyme phosphatase.

A natural enzyme activator was isolated from unbleached wheat our. This is a protein substance, possibly a lipoprotein, containg a sulphhydryl group and having the properties of a very rettive oxidation-reduction system.

A method was devised for producing papain of improved quality om papaya latex. Another was developed for separating the enyme bromelin from waste pineapple juice without preventing ubsequent fermentation.

The principal allergenic constituent of cottonseed was isolated nd characterized as a protein-like compound not conforming to ny type in existing classifications. The name "natural proteose" as suggested.

A crystalline organic selenium compound having the properties f an amino acid was isolated from a plant grown on seleniferous oil.

Improved mechanical equipment was designed for use after a ild chemical treatment for removing most of the water from veet potatoes before drying with hot air. Dried sweet-potato eal was found to be a good source of carbohydrate for balancing ottonseed meal in feeding cattle.

As high as 99·5% of the oil in ground tung nut kernels was exacted by solvent alone, without regrinding.

Soybean oil was separated by liquid-liquid solvent extraction to two fractions, one having a higher iodine number than the her.

An application was filed for a public service patent on a process for aking plastics from hemicelluloses and phenols; patents were procured processes for preparing a plastic from lignin and alkyd resins from ctic acid.

Rosin soap solutions were found to be more active as germicides ainst *staphylococcus aureus* than were solutions of soaps made from tural fats and oils.

A formerly unknown biological activity of bacteria, the production of ketogluconic acid, was discovered; the bacterium was isolated.

Carbohydrate in dried egg-white was found to be responsible for gradual darkening and decrease in water solubility. Means for eliminating carbohydrate before drying were devised.

In studies on farm structures, it was found that grass silage exerts greater pressure on silo walls than does corn silage, that low temperatures help to preserve wheat in storage and that wind-pressure ventilators on grain bins reduce moisture content.

The improved beet-seed planter developed by the bureau, which deposits single seed balls, was put on the market by a manufacturer.

A two-row sweet potato planter was developed which greatly reduces the labour of setting out the plants.

Round cotton bales and high-density bales were found to have advantages over the customary gin bales.

Improvements were made in flax-handling machinery and processes. (H. G. K.)

Chemotherapy.

Among the more valuable contributions of the year were those wherein there was reported results of more extended and critical observations leading to better evaluation of the status of the newer additions to materia medica from 1936 to 1940. Probably the chief contribution during 1940 was that of the preparation of plasma (from human blood). In many conditions the use of plasma is quite as effective as transfusion of blood or the use of blood banks. It has an advantage in that where it may be used it is not necessary to type the blood. Some pharmaceutical concerns have undertaken to prepare dried plasma which permits storage of the substance with less bulk and less danger of decomposition or freezing and prolongs its keeping qualities. Plasma will not take the place of blood where the need of additional haemoglobin or blood cells is indicated.

In 1940 another member of the sulphanilamide family made its appearance—a thiazole derivative "sulphathiazole." Its chief advantage over sulphanilamide and sulphapyridine is that it causes less nausea in many patients. Clinical work indicated that sulphathiazole may have valuable effect in dealing with infections caused by the staphylococci (sulphanilamide and sulphapyridine are very effective in certain types of streptococci). In general, sulphathiazole is, however, more effective against certain strains of streptococci, meningococci, etc., than against staphylococci.

Interest was aroused by the possibility of irradiating phosphorus with beta rays; this is done by a powerful emanator called the cyclotron. There have been many exciting, but vague, claims made about the possibilities of this substance when used in the human body. The discovery is valuable because by its use one may trace its course in the human body under certain prescribed conditions and obtain valuable data.

The interest in "war medicine" and the new research in the everchanging fields of antiseptics and germicides led to new interesting observations. Meleney and his co-workers advocated the use of a highly purified form of zinc peroxide in the treatment of war wounds. This method has not yet been generally accepted by the medical profession as a whole.

In the passage of each year the attitude of scientists towards the value in clinical medicine of antiseptics and germicides seems to become more conservative. Price and co-workers (*Arch. Surg.* 38:528, March 1939), as a result of extensive studies came to the conclusion that the best available antiseptic for skin disinfection is 70% alcohol (this is by weight, not by volume). While the mercurials are still looked upon as valuable bacteriostatic agents, they have been found to be quite deficient as bactericidal substances.

Work in 1940 has confirmed the view that stilbestrol is an efficient and relatively cheap substitute for the natural female sex hormones, so far as its activity is concerned, but the possibility of toxic reactions following its use convinced authorities that its sale in interstate commerce was unwise, and a number of pharmaceutical houses withdrew their applications to the U.S. Food and Drug administration for permission to sell the product in interstate commerce.

No new vitamins were introduced into therapeutic practice during 1940. Authorities in the treatment of pellagra have come to the conclusion that, while nicotinic acid is often a specific against this disease, very frequently patients having a vitamin B_1 (thiamin hydrochloride) or a nicotinic acid deficiency are also deficient in the intake of other members of the vitamin B complex, particularly nicotinic acid and riboflavin. There was no confirmation of the suggestion made in 1939 that vitamin E is effective in overcoming the progressive disease known as amyotrophic lateral sclerosis, for which the newspapers coined the name "garret's disease."

The medical profession and the public were particularly cautioned during the year against the indiscriminate use of nasal sprays which contained liquid petrolatum. This substance, if induced into the lungs, causes a pneumonia, not infrequently fatal, which, for lack of a better name, has been termed "lipoid" pneumonia.

Ever since the introduction of insulin, investigators have endeavoured to isolate new hormones from the pancreas. Some evidence has been adduced which seems to warrant the conclusion that an active substance of the pancreas is probably not choline, and that there is a specific internal secretion of hormone, distinct from insulin, which has some effect against fatty degeneration of the liver. Much more informative evidence is necessary.

Considerable interest was aroused during 1940 about the possibility of histaminase, an enzyme, being used for desensitizing certain types of allergic individuals.

The council on pharmacy and chemistry felt, however, that the evidence was not sufficient to recognize the use of the drug for this purpose.

The question of the use of bromides continued to be quite a problem and reports of bromide intoxication were increasing. The government took steps to require a limit on the amount of bromides which might be sold to an individual over the counter and physicians were cautioned against the too prolonged, or frequent, use of ordinary bromide preparations.

A method that has great possibilities for use was the continuous drip method of administering certain antisyphilitic drugs. In cases under trial, syphilis has been cured in as few as five days.

However, the method is not without danger and the authorities working on it have strongly warned against its trial except under competent conditions.

For many years manganese compounds have been extolled for the treatment of certain disorders, particularly of the skin. A thorough study was reported in 1940 which discredited the vaunted value of manganese compounds. (*See* also DENTISTRY; PNEUMONIA; SURGERY; UROLOGY; VITAMINS.) (P. N. L.)

Chemurgy. The consumption of farm-grown raw materials for non-food purposes advanced more in the U.S. in 1940 than in any previous year. There was also a marked increase in chemurgic research.

The basic idea of chemurgy is to advance the utilization of farm materials in industry, mainly for inedible and nonwearable consumption through (a) new uses for present crops; (b) new crops for new or established uses; and (c) profitable markets for wastes.

The requirements of U.S. national defence, and the appearance of actual or impending shortages of materials formerly imported, stimulated research looking toward supplying national needs with domestic farm crops and toward establishing new crops. Surveys indicated extensive opportunities to develop domestic agricultural production of materials for which the nation has heretofore relied on foreign sources.

As a case in point, with tung oil supplies in the U.S. for only six months' requirements and importations dependent upon the Burma road remaining open, the paint and varnish industry turned with new interest to home supplies for the annual consumption of 700,000,000lb. of drying oils. Gulf coast tung orchards contributed 5,000,000lb., their largest crop to date. Soybean oil use in paint increased notably. Demand rose for dehydrated castor oil, which is suitable for many of the uses of tung oil. Preparations were being made for resuming farm production of castor beans which has been slight since the end of the 19th century. Castor-bean supplies come mainly from Brazil, more than 150,000,000lb. annually being imported.

An important new step in the drying-oil field was a process for fractionating vegetable oils. By this process, which in principle resembles petroleum distillation, the fraction of the oil with a high iodine number may be drawn off and sold as a drying oil, while other portions remain suitable for soap. The maximum values of the oil are obtained. Operated by a Chicago meat-packing company, the process is in commercial operation.

Important to the dairy industry was the appearance in 1940 of a commercial process for manufacturing fibre from casein, a product of skim milk. The fibre made its bow to the public in men's felt hats. Hat manufacturers, who have depended mainly on rabbit fur grown in northern Europe for their best felts, pronounced the new milk fibre superior in every respect except toughness. Ten per cent or more of the casein fibre was in 1940 being used in a large proportion of the better felt hats manufactured. The casein fibre consumption for 1940 was estimated at 800,000lb. Since this represents only one-tenth of one per cent of the amount that could be made from the annual 40,000,000,000 lb. of skim milk that have only limited commercial outlets, it is expected that future production will increase extensively. Casein "cold water" paints consumed 1,500,000,000lb. of skim milk. Plastics and paper-sizing utilized smaller quantities.

Another synthetic fibre that advanced during the year to a point where commercial utilization was soon expected is a product of soybean protein. It will be used first in automobile upholstery.

Matured in 1940 was a new step in cotton production with high chemurgic significance. This was the result of a request made in 1935 to tire manufacturers by a Mississippi cotton planter. He asked for the specifications of the foreign cotton they imported for tire fabrics. With the specifications in hand, he employed a plant geneticist, and in 1940 sold, at a substantial premium, 3,000 bales of cotton grown to meet these specifications. The effect of his achievement, which will be measured in immensely larger production in succeeding years, is not only to promise the tire industry domestic supplies, but to take a portion of the cotton crop out of the highly competitive market for the ordinary fibre.

Advances were reported in a new use for cotton that may, if proved successful, consume large quantities. This is for insulation, the fibre being fireproofed by a simple chemical process.

The initial large-scale mill to utilize southern pine for newsprint completed its first full year of operation. Established at Herty, Texas, in late 1939, at a cost of more than $6,000,000, the mill ran steadily and sold its output of 150 tons daily to near-by newspapers. Efforts were begun looking toward a second newsprint mill. Numerous craft-paper mills and wallboard companies made markets for vast acreages of woodland.

Also completing its first full year was the new cigarette paper plant at Brevard, N. C. Operating at the rate of a carload and a half of cigarette paper daily, the mill consumed a heavy tonnage of flax fibre purchased from farmers in California and Minnesota. The mill provided a wholly new market for these farmers, as well as new employment for more than 1,000 workers at the factory itself. Formerly a French industry, utilizing European linen rags, the new enterprise has been so successful that during 1940 building operations were doubling the size of the plant.

Two sweet potato starch factories, producing grades of starch to replace imported tropical root starches, operated profitably at Laurel, Miss., and St. Francisville, La. Output at Laurel rose to nearly 3,500,000 lb. The white potato starch industry in Maine was enlarged.

The still-rising nonfood use of soybeans in industry was indicated by the fact that in 1940 this type of consumption appeared to exceed 15% of a crop of nearly 90,000,000 bu. In 1935 the industrial uses were estimated at 5% of a crop about half the size. Soybean oil consumption in paints increased notably, being stimulated by the rise in tung oil prices. Soybean materials were used in automobile parts, plastics, enamels, printing inks, stearic acid, glycerine, foundry cores and for producing lecithin, among many others.

Chemurgic research on a broad scale was initiated with the opening of the new federal regional research laboratories. Costing about $2,000,000 each, the laboratories at Philadelphia, Pa., Peoria, Ill., and San Francisco, Calif. were opened during the last half of 1940, while the one at New Orleans approached completion. Congress appropriated $800,000 annually for their operation.

Corn, wheat and agricultural wastes will be the principal subjects of research at Peoria. Particular attention will be given to the study of motor fuels from farm-grown materials, including anhydrous ethyl alcohol, fermentation gases and the possibilities of starch or other fine dust in engines utilizing the principle of the dust explosion.

Tobacco, apples, milk, potatoes and vegetables will be investigated in the eastern laboratory at Philadelphia. In the western laboratory fruits, vegetables, potatoes, wheat and alfalfa will be studied. Cotton, sweet potatoes and peanuts will be the special subjects at New Orleans. The research of the four laboratories will be carefully co-ordinated with each

other and with the state experiment stations. Around 250 research experts will work at each institution.

Since the regional laboratories are directed by law to confine their work to finding new markets and uses for the surplus crops, plans are under way for supplementing their efforts with another approach to the surplus problem. This is the development of new crops which, by replacing the overproduced crops on substantial acreage, may help to prevent the surpluses from coming into existence. Legislation authorizing an appropriation to create new crop research units at the state experiment stations, and to provide for extensive plant exploration, will be sought during 1941. Advocates point out that of the 15,000 plant species growing in the United States, and of the 250,000 named species in the world, only a few hundred are utilized commercially. It is believed that a survey of plant characteristics, conducted with the resources of the organic chemist and of the plant geneticist in mind, may yield important new crops to add to the American agricultural repertoire, and contribute toward a permanent solution to the aggravating problems of chronic surpluses.

Industrial laboratories reported extended chemurgic types of research during 1940, prompted partly by desire to establish domestic sources of materials and partly by the wish to contribute toward improved farm purchasing power. Some were inspired by economies and successes achieved by other industries.

Indiana added an official chemurgic commission appointed by the governor to those existing in Ohio, Missouri and other states. Illinois organized a state commission with able membership.

State teachers' colleges in Texas and Louisiana continued their chemurgic courses with heightening interest. At Romayor, Texas, the Trinity Valley Chemurgic institute, an independent chemurgic school, was financed and established by local citizens to explore the natural resources of the surrounding area.

The headquarters of the National Farm Chemurgic Council, Inc., the organization devoted to furthering chemurgy in the United States, are at 50 West Broad Tower, Columbus, Ohio.

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Cherokee Dam: *see* TENNESSEE VALLEY AUTHORITY.

Chess. What was considered the greatest chess event of 1940 was the U.S.S.R. championship tourney in Moscow when Paul Keres, of Estonia, exhibited a sensational victory over Dr. Max Euwe, of Amsterdam, former champion of the world. In a second title event in Russia, Bondarevsky and Lilienthal shared first honours, scoring $13\frac{1}{2}$ to $5\frac{1}{2}$, the only competitors not to lose a single game. Next came 19-year-old Smyslov, and Keres, fourth. An unexpected upset was the defeat of Levenfisch, one of the old guard, who had hitherto been at or near the top, but who finished next to last in the strong field of 20.

The great American classic, the national chess championship, played in the Hotel Astor, New York City, hailed Sam Reshevsky as the winner for the third time. Though he competed under the handicap of illness, he went through the tourney without losing a game. Paired with Reuben Fine in the last round, the result became a dramatic struggle, with Reshevsky fighting his way to the top.

Of the 20 state championships, the event conducted by the N.Y. State Chess association, at Colgate university, drew a large entry list. Robert Willman led one of the strongest fields in the history of this classic game. Anthony Santasiere and Jack Soudekoff, one point behind the winner, tied for second and third places. The tourney at Ventnor City, N.J., comprising 448 players, finished with a tie, with Sidney Bernstein and Milton Hanauer winning 8 games and losing 3. Fine won the tourney in Utah; Erich Marchand won in Missouri; J. C. Thompson, of Dallas, won in Texas.

The 1940 open tournament of the U.S.C.F. at Dallas was won by Fine with a perfect score of 8–0, with Steiner finishing in second place. The Massachusetts tourney was won by Harlow B. Daly, with Adams and Katz tied for second. R. S. Scrivener won the St. Louis championship with a splendid score of 9 wins, no losses and 2 draws.

Frank J. Marshall, New York's "grand old man of chess," exhibited his skill before an interested audience while competing against some of the strongest local talent, yet he won 19 games, drew 10 and lost 2 games. The Manhattan Chess club won the title in the Metropolitan Chess league. In the Commercial Chess league (of N.Y.) the Consolidated Edison team defeated team "A" of the N.Y. *Times*. Yale emerged triumphant in the annual tournament of the College Chess league, and Brooklyn college led in the Intercollegiate Chess league, winning the Harold M. Phillips Trophy. (J. B. P.)

STUDENTS OF FOUR eastern U.S. colleges competed in Jan. 1940 for the Belden-Stephens chess trophy. Yale won the tournament

Chiang Kai-shek (1886–), a native of Feng-haw, Chekiang province, received his education at the Chinese and Japanese military colleges from 1906–10 and gained his military experience as a less prominent follower of Sun Yat-sen in the national revolutionary movement from 1910–22, as a military observer in Soviet Russia in 1923 and as the president of the Whampoa Military academy in 1924.

Chiang became internationally prominent as generalissimo of the Nationalist Northern expedition in 1926. Breaking off relations with the communists Chiang established the National government at Nanking in 1927, and married Mayling Soong (sister of T. V. Soong, the financier) in December of the same year. In 1928 Chiang nominally unified China but the rivalry of the opponents of the Kuomintang and of his colleagues and associates continued. In the name of the central government he crushed these rebellions and, by political counsel and military manoeuvring, won the support of his last important military and political opponents. After the Sian incident of Dec. 1936, Chiang made peace with the communists against whom he had campaigned for approximately ten years.

Since the outbreak of the war with Japan Chiang's leadership has been unquestioned and his popularity has grown. Despite military reverses Chiang has been firm in his policy of resistance and confident of the outcome of the war. Upon his shoulders rest many important military, political, economic and social responsibilities. He is Tsung Tsai (director-general) of the Kuomintang, president of the Kuomintang youth corps, premier, president of the Supreme National Defence council, chairman of the National Military council, commander-in-chief of all the military forces, chairman of the People's Political council, governor of Szechuan province (until Nov. 1940), president of the combined national central banks, promoter of the New Life movement since 1934, director of the movement of the national spiritual mobilization for resistance since 1939, and author of the philosophy of action in 1940. Chiang is regarded as the symbol of a new China and its unity. (*See* also CHINESE-JAPANESE WAR.)

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Chicago, U.S. city, port of entry, county seat of Cook county, Ill., is at the southwest corner of Lake Michigan. It is the second city of the United States in population, manufactures and volume of trade. It is the largest centre of rail traffic and of air traffic and is a port for a great tonnage conveyed by lake ships, principally bulk cargoes of iron ores, fuel, and blast furnace flux. It has access by the Illinois waterway to the inland navigation routes of the Mississippi valley. Small steamers make direct ocean voyages to and from Chicago via the St. Lawrence river and the Welland canal.

The population of the city proper as ascertained in the 1940 U.S. census was 3,396,808, an increase of 20,370 over the population enumerated in 1930. Part of the retarded rate of growth was due to the movement of population to the suburban areas, a continuation of a long-time trend that persisted since 1930 and caused new losses of Chicago's downtown population.

But the rate of suburban growth also showed a decline, and Cook county (in which Chicago is located) had the smallest gain in a century of decennial enumerations. The population of the counties of Lake, Cook, Du Page, Will and Kane, and of Lake county, Indiana, in which most of the population is in the "Chicago metropolitan area," was 4,807,138 according to the 1940 census.

While the decline of Chicago's population growth from 25% in the 1920–30 period to less than 1% from 1930 to 1940 may be attributed in part to the same causes that halted the growth of nearly all the larger U.S. cities, including the movement of population to the south and west, the falling birth rate was also largely responsible. The average Chicago family now is less than three persons, compared to an average of 3·8 for the United States at large and 3·6 for the state of Illinois as a whole. This was reflected in 1940 in a decline of 30,000 in the elementary school enrolment. Nevertheless the number of marriage licences issued in 1940 exceeded all previous records with a total of 44,234.

Business improved steadily in Chicago throughout 1940, reaching unprecedented volumes in the last quarter of the year. To some extent this was a result of government orders under the national defence program. At the end of the year, output of steel in the Chicago metropolitan area was close to capacity, the U.S. Steel corporation's plant at Gary operating at a rate of 99%, highest since wartime output in 1918. Contracts awarded to Chicago industrial concerns by the war department in 1940 aggregated $232,945,331, by the navy department $30,755,471.

Revival of building continued in 1940. Residential building, mostly in the outlying parts of the city and the suburbs, provided 4,271 dwelling units in the metropolitan district in the first half of the year, of which 4,098 were single family houses with a valuation of $23,251,918. Only 34 apartment buildings were erected.

At the close of 1940 the tubes of Chicago's new subway system were 83% completed, with only a small gap under State street unbored. The system was extended in 1940 by provision for 2,000ft. of tubes in Congress street to extend the Dearborn street system, at a cost of $6,000,000. The city was negotiating in 1940 for a loan of $53,000,000 from the Reconstruction Finance corporation to equip the tubes with tracks and rolling stock. This loan depends upon settlement of unification negotiations and receivership suits involving the surface street railways, the elevated system and bus lines. After 14 years of litigation, negotiations and engineering surveys, which have cost $7,000,000, no settlement has been reached.

The tentative budget for Chicago's government, including city corporation, school district, park district, sanitary district, forest preserve district and the public service enterprises, Navy pier, water works and airport, contemplated expenditure of $163,081,462 for 1941.

PROMINENT FIGURES at the 1940 Democratic convention were Harry L. Hopkins and Mayor Edward J. Kelly of Chicago

In the national election, Chicago in 1940 retained its customary place in the Democratic column. President Franklin D. Roosevelt received 1,029,538 votes to 731,716 for Wendell Willkie, Republican. All Democratic candidates for local, state and national offices received majorities in Chicago, with the exception of the Ninth Congressional district where Charles S. Dewey, Republican, displaced a Democratic congressional incumbent. The Democratic convention was held in Chicago in July 1940.

Although the highest vote in the history of the city was cast, the election was one of the most orderly ever witnessed and there was a minimum of charges of fraud. Gang warfare practically died out in Chicago in 1940. The only notable criminal trials involved evasion of federal income taxes. (L. H. L.)

Chicago, University of. An institution of higher education and research in Chicago, Ill., founded in 1891. Privately endowed, the university is co-educational and non-sectarian, although not less than three-fifths of its trustees must be members of Christian churches, and a majority of the three-fifths must be members of Baptist churches.

During the summer quarter, 1940, 4,328 students were enrolled in the university, of whom 2,200 were men and 2,128 were women. The total enrolment for the academic year 1939–40 was 11,674, which was a decrease of 846 from the previous year. The home study (correspondence) department had an average enrolment of 3,725, which is exclusive of the totals given above. The university granted 1,636 degrees during the academic year; 486 were master's degrees and 161 were doctorates of philosophy.

The total funds held by the university as of June 30, 1940, amounted to $128,536,026, an increase of $2,700,585 over the same figure for the same date in 1939. These funds were divided as follows: Endowment, $72,569,187; plant, $45,411,132; other funds, $10,555,707.

The total income of the several divisions of the budget was $8,504,986, an increase over the income of the previous fiscal year of $129,542. This total of budget income does not include income of auxiliary enterprises such as residence halls, commons, bookstores, and student social facilities, nor restricted expendable gifts. Including such income, the total current income for 1939–40 was $10,760,170.

The total amount of gifts paid in was $1,731,517.

The libraries added approximately 29,489 volumes, raising the otal to 1,300,785. President, Robert Maynard Hutchins, LL.D. The university in the academic year of 1940–41 celebrates its oth anniversary, which will culminate in a four-day festival in ept. 1941.

Chicago Subway: *see* CHICAGO; TUNNELS.

Child Labour. The year 1940 marked the end of a decade of progress in the United States in the development of safeguards for employed youth, progress made in the face f industrial depression and emergency situations. During this 10-ear period child-labour standards have advanced and child em-loyment has been reduced.

These standards have been raised in individual states from year o year by state legislation and throughout the nation by federal egislation, first by the National Industrial Recovery act, effective 933 to 1935, and after the year 1938 by the child-labour rovisions of the Fair Labor Standards act, which went into effect ct. 24, 1938. In child-labour legislation the tendency has been oward the establishment of a basic 16-year minimum-age stand-rd of employment, and this standard was set by the statutes of 3 states, including a number of important industrial states. This tandard has also been in effect under both federal laws enacted n this decade.

During 1940 there were significant developments in administra-ion of the child-labour provisions of the Fair Labor Standards ct, in state child-labour legislation, and in the formulation of tandards for certain neglected phases of child labour, such as ndustrialized agriculture. Standards for child labour and youth mployment were approved at the White House Conference on hildren in a Democracy held in Jan. 1940, and follow-up con-erences in the states have been held with a view to promoting hese standards.

Federal Fair Labor Standards Act.—The responsibility for he administration of the child-labour provisions of the Fair Labor tandards act of 1938 is placed in the children's bureau of the nited States department of labor. These provisions have the ffect of excluding children under 16 years of age from employ-ent in establishments producing goods for shipment in interstate r foreign commerce, except for certain limited employment of hildren 14 and 15 years of age at work other than manufactur-ng and mining. In addition, minors 16 and 17 years of age may ot be employed in establishments covered by the act in occupa-ions found and declared by the chief of the children's bureau to e hazardous or detrimental to their health or well-being.

The plan of co-operative relationships with state and local edu-ation and labour officials in the administration of these pro-isions was further developed in 1940. This program has had a wofold aspect: first, obtaining voluntary compliance by employ-rs by making certificates of age for young workers available for heir protection, and second, working out a system of co-opera-ion with state and local agencies issuing employment certificates nder state child-labour laws that would not only provide such ertificates but also strengthen the administration of state laws. tandards have been set up for issuing certificates, and state offi-ials have agreed to make certificates of age available in 42 states nd the District of Columbia. An advance during the year was the xtension of these co-operative plans for making certificates of age avail-ble to Puerto Rico and Hawaii. Federal certificates were being issued n four other states with the assistance and close co-operation of state nd local officials, and in the two remaining states and in the territory f Alaska negotiations for co-operation are under way. This program ressed the value of reliable evidence of age, particularly of birth ertificates, and helped to bring about the use of better techniques by ocal officials and by state agencies responsible for the administration of tate child-labour laws.

The act places upon the children's bureau the duty of determining what ccupations are particularly hazardous or detrimental to the health or well-being of minors 16 and 17 years of age, and after such determination has been made and an order issued an 18-year minimum age is in effect for work in the occupation covered. These determinations are based on a thorough study of available information and upon consultation with experts in industrial safety, employers and employees and on information presented at public hearings. The orders in effect covered occupations in establishments manufacturing explosives or articles containing explosive components (1939), all employment as drivers of motor vehicles or helpers on such vehicles, and all work in or about coal mines, exempting only certain specified surface occupations (1940). Investigation of hazards for young workers are now under way in the logging and lumbering, woodworking and shipbuilding industries.

State Legislation.—In New Jersey, an amended child-labour law established a basic minimum age of 16 years for employment, a maximum 8-hour day and 40-hour week for minors under 18 years of age, and an 18-year age minimum for work in certain hazardous occupations. The minimum age for work in agriculture and in street trades during school hours was set at 16; for work outside school hours, a minimum age of 12 years was set for farm work and for boys in street trades a minimum age of 14, except that boys of 12 years or over may deliver newspapers and magazines on residential routes.

Children in Industrialized Agriculture.—The year 1940 saw an increasing public consciousness of need for better child-labour standards in industrialized agriculture and an increasing awareness of the problems of migratory workers, particularly those employed in large-scale farming operations. Federal and state agencies were seeking solutions for the many problems involved in the migration of workers, particularly of family groups in search of employment. The application of the Fair Labor Standards act to agricultural child labour was extremely limited, and state efforts to regulate the employment of children in industrialized agriculture were few and narrow in their application.

Extent of Child Labour.—The 1940 decennial census should give comprehensive information on the number of employed children and youth in the United States. Until these figures are available, other sources of information must be relied upon.

According to data obtained by the Social Security board in connection with the administration of the Federal Social Security act, the number of workers under 18 years of age receiving taxable wages in 1938 was approximately 730,000. These figures include not only regular workers but also young persons still attending school and having part-time jobs. They do not cover children working in agriculture or in domestic service in private homes.

Information on trends of employment of young persons is found also in figures on the issuance of employment certificates, which are required in many states before children can go to work in industrial or commercial occupations. Reports received by the children's bureau of the U.S. department of labor indicate that the number of children under 16 years of age leaving school for work decreased in 1940 in the face of increasing general employment.

Maintenance of Child-Labour Standards.—A determined effort was being made to maintain labour standards in spite of the need for increased production in the United States for defence purposes. The advisory commission of the Council of National Defense adopted a statement of labour policy which calls for compliance with all federal and state statutes affecting labour.

Child Labour Outside the United States.—In European countries the war brought the development of protective legislation for young workers practically to a standstill and has caused the authorization of exemptions from existing legislation.

In Great Britain, at the beginning of the war in 1939, the effective date of the Education act (1936), which raised the school-leaving age from 14 to 15, was suspended. During the first few months of hostilities many temporary exemptions permitting employment up to 48 hours a week were granted from the provision of the Factories act, which, effective July 1, 1939, had reduced the hours of work of children under 16 years of age to 44 a week. In a number of countries, including France, Germany and Belgium, suspensions of labour legislation, including restrictions on child labour, were authorized.

Nevertheless, it was clear that efforts were being made to avoid the more serious abuses that occurred in the war of 1914–18, and during 1940 a movement to restrict such relaxation of standards was evident.

In Great Britain the number of exemptions from the regulations regarding hours of labour for children under 16 years of age in factories was greatly decreased, and the law reducing hours of work of children under 16 in shops to 44 a week became effective Jan. 1, 1940. Local education authorities were urged by the Home office and by the minister of education to maintain carefully the protection given to children by existing law and to guard against the risk of excessive employment, even at times outside school hours when permitted by law.

In Germany, the authorization to suspend labour laws was restricted by later orders, and in France instructions issued by the ministry of labour recommended the authorities not to take advantage of the extension of the statutory hours of work for young persons except in special cases, and then only temporarily.

Relaxation of standards respecting hours of labour for young workers either by exemptions or through new legislation was taking place in Italy, Rumania, the Soviet Union and Turkey. In Italy, where the legal minimum age is 14, the services of children 13 years of age might be requisitioned for occupations essential to the prosecution of war.

In Switzerland, regulations were issued in Feb. 1940 for the administration of the federal law of 1938, which raised the minimum age for employment of children from 14 to 15 and was to go into operation March 1, 1940. However, this effective date was postponed in 11 of the 22 cantons and in part of a 12th, and even in the areas where the law went into effect permission was given for the granting of exemptions allowing children over 14 years of age to work in factories.

In many countries of Latin America the development of child-labour protection continued along with the rapid development of other child-welfare activities in recent years.

The constitution of Cuba, adopted by convention in June 1940, reaffirmed the child-labour provisions of the existing law, including a 14-year minimum age for employment. A new federal law in Mexico, which unifies the educational system on a national basis, made school attendance compulsory for children up to 15 years of age.

In Brazil, a commission was appointed by the minister of labour to study existing legislation relating to the employment of children and women. A presidential decree also prohibited minors under 18 from engaging in street trades on their own account and established a minimum age of 14 for those working in such trades for an employer. In Chile, the new ministry of labour, established in 1940, contains a special unit for the administration of laws relating to the employment of children and women.

In Canada, the dominion government urged that hours of work should not be unduly extended but that where increased output is desired it should be secured if possible by the adoption of additional shifts. In Quebec an order in council of March 23, 1940, provided for emergency exemptions from the night-work prohibition for women and young persons under 18, on approval of the minister of labour. In Manitoba, the employment in mines or metallurgic works of boys under 16 above ground or of boys under 18 below ground was prohibited.

International Labour Office.—The International Labour office continued to maintain its essential activities despite the war, but in Aug. 1940 its personnel was transferred temporarily to Canada, on account of difficulties of communication and transportation. The only action on any child-labour convention reported during 1940 was the ratification by China in Feb. 1940 of the convention setting a basic minimum age of 15 in industrial undertakings.

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Children's Books.

Emphasis on biography was continued in 1940. The titles listed first in 1939's report were honoured in June as the two outstanding children's books of 1939. *Abraham Lincoln,* by Ingri and Edgar Parin d'Aulaire, was awarded the Randolph Caldecott medal as the most distinguished picture book, and *Daniel Boone,* by James Daugherty, won the John Newbery award. Among current biographies, *Nansen,* by Anna Gertrude Hall, appeared early. *Introducing Charles Dickens,* by May Lamberton Becker, was the last and one of the best. Others were: *River Boy* (Mark Twain), by Isabel Proudfit; *Wings for Words* (Gutenberg), by Douglas C. McMurtrie; *Early American* (Paul Revere), by Mildred Pace; *Boat Builder* (Robert Fulton), by Clara Ingram Judson; *Elizabeth, the Tudor Princess,* by Marian King; *They Were Good and Strong,* by Robert Lawson. The latter is fully illustrated for picture book age.

A Book for Jennifer, by Alice Dalgleish, is a charming story of John Newbery and his London bookshop which presents welcome subject matter.

Among attractive nature books were: *Children of the Sea,* by Wilfred Bronson; *Animals Nobody Knows,* by Ivan T. Sanderson; *Tale of the Whitefoot Mouse,* by Henry B. Kane; *Presents for Lupe,* by Dorothy Lathrop.

Current fiction included: *Thee, Hannah!,* by Marguerite de Angeli; *Paradise Valley,* by Valenti Angelo; *The Luck of Scotland,* by Iva Bolton; *Buttonwood Island,* by Lavina Davis; *The Sea Is All Around,* by Elizabeth Enright; *River Empire,* by Helen Clarke Fernald and Edwin M. Slocombe; *Blue Willow,* by Doris Gates; *The Fair Adventure,* by Elizabeth Janet Gray; *The Iron Doctor,* by Agnes Danforth Hewes; *Flossie Come Home,* by Eric Knight; *The Year of Jubilo,* by Ruth Sawyer; *Faraway Trail,* by Charlie Simon; *Call It Courage,* by Armstrong Sperry; *The White Isle* (early Britain), by Caroline Dale Snedeker; *The Lone Winter,* by Laura Ingalls Wilder.

The Harper's Daughter (legend of Deirdre), by Michel Alan Buck, and *Heroes of the Kalevala,* by Babette Deutsch, represented versions of literary classics for young people. Folklore included: *Little Black Hen,* by Eileen O'Faolain; *Piskey Folk,* by Enys Tregarthen; *Happy Times in Czechoslovakia,* by Libushka Bartusek; *Where the Wind Never Blows,* by Padraic Colum; *American Mother Goose,* by Ray Wood; *Peter and the Wolf,* a Russian folk tale by Serge Prokofieff with an orchestral narrative as presented by Serge Koussevitsky and the Boston Symphony Orchestra.

Meeting new interest in the Central and South American republics were: *The Legend of the Palm Tree* (Brazil), by Margarida Estrela Bandeira Duarte, illustrated by Paulo Werneck; *Little Jungle Village* (British Guiana), by JoBesse McElveen Waldeck; *The Cedar Tree* (Guatemala), by Addison Burbank; *Children of the Fiery Mountain* (Guatemala), by Marian Cannon; *Manuelito* (Costa Rica), by Zhenga Gay and Pachita Crespi.

Books of information were numerous. Aviation and vocational subjects were emphasized.

Reading with Children, by Anne Eaton, was an outstanding contribution on children's literature. A very complete *Subject Index to Children's Plays* was published by the American Library association.

In England, the Carnegie medal for the most distinctive children's book of 1939 was awarded to *The Radium Woman* (Madame Curie), by Eleanor Dooley. This was another tribute to biography. (*See* also LITERARY PRIZES; PUBLISHING.)

(E. L. P.)

Children's Bureau, United States: *see* CHILD LABOUR; CHILD WELFARE; JUVENILE DELINQUENCY.

Child Welfare.

A glance at the child-welfare development outside the United States in 1940 reveal two outstanding phenomena:

(1) In Europe the devastating effects of the war on children and the disorganization of the activities ordinarily engaged in for children.

(2) In Latin America significant efforts to provide greater safeguards for the young generation.

Child-welfare work in the United States in 1940 received fresh stimulus from the activities of the White House conference on children in a democracy which adopted in Jan. 1940 a general report with recommendations constituting a program in behalf of children for the coming decade. Two committees were appointed to give impetus to the program. A National Citizens committee is giving assistance in organizing state and local follow-up programs. A Federal Interagency committee will serve as a source of information and co-ordinated planning for federal agencies and will co-operate with the National Citizens committee. By Nov. 1940 follow-up programs were definitely under way in 11 states and organization plans were started in other states.

The National Citizens committee issued in June a declaration in relation to child conservation and national defence expressing the conviction that child welfare and national security are inseparable and that the program adopted by the conference will make for national unity and will strengthen the democratic institutions of the country.

The conference publications were being distributed by the children's bureau, United States department of labor, Washington, D.C.

Benefits for children under federal-state programs initiated by the Social Security act of 1935 were extended in 1940. Puerto Rico was given its first federal grants for maternal and child health services, services for crippled children and child-welfare services. In continental United States federal-state programs for maternal and child-health services were expanded; in a few

elected areas medical and hospital care were made available for others at delivery. Special emphasis was placed on care of premature babies, among whom the death rate is unduly high. With increased federal funds significant progress was made in egistration of crippled children and in the extension of medical, ospital and aftercare services. Ten state crippled children's gencies undertook programs for the care of children suffering om heart disease. Federal funds for child-welfare services ere being used in all the states to encourage the development community child-welfare programs, and local child-welfare orkers were being employed in 522 counties or local areas to ve service to homeless, dependent and neglected children, and ildren in danger of becoming delinquent. There were still many ildren, dependent according to federal definitions, who were not ceiving in 1940 the benefits of federal aid either because of adequate state appropriations or in seven states and Alaska ecause provision had not yet been made for co-operation with e federal government under the program for aid to dependent ildren.

In the fiscal year ended June 30, 1940, federal funds were paid states under Title V of the Social Security act as follows: or maternal and child-health services, $4,823,207; for services r crippled children, $3,378,986; for child-welfare services, 1,497,074. Under Title IV of the act: For aid to dependent ildren, $46,113,458. State and local funds for these purposes ere also made available.

There were 2,265,588 live births in the United States in the calndar year 1939. The birth rate (17·3 per 1,000 population) was ightly lower than that for 1938 (17·6). Maternal and infant ortality rates in the United States, reflecting improved maternal nd child care, continued to decline. The maternal mortality for 939 was 40 deaths from puerperal causes per 10,000 live births, reduction of 9% as compared with the 1938 rate (44). The 939 infant mortality rate, 48 deaths of infants per 1,000 live rths, was 6% less than the 1938 rate (51).

An order adopted by the commissioner of immigration and aturalization with the approval of the attorney general of the nited States provides simplified procedure for the admission to e United States of children seeking refuge from the dangers of ar. Children admitted under the auspices of non-profit corporaons, according to the order, must be assured of reception, placeent and care in conformity with the standards of the United tates children's bureau. The bureau was maintaining a central egister of all children coming to the United States unaccomanied by or not coming to both parents.

Great Britain and Europe.—In the countries at war, so far as can assumed from the limited information available, evacuation of children om zones exposed to air raids to less dangerous localities constituted major problem. In England evacuation of children from London, begun 1939, continued on a voluntary basis. Parents able to pay for the re of their children were asked to do so; in other cases the government id a specified amount. However, many parents hesitated to part with eir children. The British dominions offered to take children either for e duration of the war or on a permanent basis and many children ere evacuated to the dominions. In the United States the children's ureau of the department of labor co-operated with the department of stice and the United States committee for the care of European children developing and carrying out plans for the care of children coming to e United States.

Early in October the British government decided that evacuation overas should be suspended because of the risks of transportation. By the d of Oct. 1940, 563,000 children had been moved from the London rea to other parts of Great Britain and overseas but 279,000 still reained there. In Germany, evacuation of children from Berlin was begun Oct. 1940, but no details were available because of censorship rerictions.

The war left its mark on school attendance. Many schools were osed under the threat of air raids, or because of mobilization of many achers, or use of school buildings for military purposes. In England in e cities subject to air raids and in other localities only a part of the ildren were attending school. It was reported in Feb. 1940 that out of 250,000 children in London and other danger areas 400,000 were getting schooling. According to an official estimate three-fourths of the 92,000 hool children remaining in London in Dec. 1940 were not going to school. Truant officers were appointed for the enforcement of attendance.

Disorganization of the medical services for children because of the mobilization of physicians and nurses was reported from England. Elsewhere, even in the neutral countries of Europe, welfare work for children was greatly curtailed.

Japan.—To compensate low-paid workers with children for the increased cost of living the government of Japan ordered in 1940 the payment of family allowances to workers in private and public service whose earnings are below a specified amount and who have one or more dependent children under 14.

Netherlands.—In the Netherlands a law for a similar purpose enacted late in 1939 was to become effective in 1940. Allowances were to be paid for each child under 15 beginning with the third. The cost of the plan in both countries was to be borne by the employers.

Spain.—In Spain several thousand orphans of the civil war of 1936–38 were made wards of the state, a measure similar to those taken by France and Italy in 1917 with regard to the orphans of the war of 1914–18. These children who heretofore were dependent on public charity or had to shift for themselves will be placed in foster homes or institutions under the supervision of a special board.

Latin America. — In most countries of Latin America child-welfare activities continued in 1940 to make substantial progress. A desire for United States guidance and co-operation was manifest. Co-ordination of all work for children under one national agency took place in Brazil with the creation of the National Children's bureau. This bureau will co-ordinate and supervise all services for mothers and children and administer federal aid to the states and municipalities for building and helping to maintain maternity homes, children's hospitals, prenatal and child-health centres, and other institutions. In Chile a central bureau for the medical-social protection of the mother and child was organized. All work done for children by the departments of health, education and justice was placed in the charge of this bureau. A bill for the establishment of a supreme council of maternal and child welfare was pending in Chile.

The problem of nutrition received much attention in Latin America. In Brazil a plan was prepared for the establishment of a nutrition service to promote better food habits among the working people throughout the country and to further the provision of an adequate food supply at reasonable prices The establishment of a government bureau with similar functions was ordered in Peru. In Colombia, Costa Rica and Guatemala national committees or councils were appointed to study the food habits of the people and methods for their improvement.

In Uruguay under a law passed early in 1940 every employer giving out work to be done in the worker's home must keep a register stating the worker's name, residence, nature of the work, number of pieces of work with the dates of issuing and delivering, and the amount of the worker's pay. Similar information must be kept by the worker. Minimum wages will be determined by committees to be instituted for that purpose. The national bureau of labour must keep a list of persons engaged in industrial home work. Industrial home work is not permitted in dwellings occupied by persons with contagious disease.

Social insurance continued to make progress in Latin America. Insurance against the risks of illness, maternity and industrial accidents and diseases was made compulsory in Venezuela for persons employed in commerce and industry with earnings below a specified amount. In case of illness the insured person and members of his family are entitled to medical and surgical care and medicines. A daily cash benefit is paid in case of incapacity for work. The maternity benefits consist of obstetrical care and cash payments for six weeks before childbirth and six weeks afterwards. A bill providing various forms of social insurance, among them maternity insurance, was pending in the federal congress of Mexico in 1940. In Cuba a bill for the reorganization of compulsory maternity insurance instituted in 1937 for employed women and another for the introduction of compulsory insurance against sickness for all workers passed the lower house of congress.

Provision for health services, day nurseries, kindergartens and vocational schools is included in a federal law in Mexico which unifies the educational system on a national basis.

Registration of births was made compulsory in Venezuela for the purpose of instituting supervision over the health of newborn children as early as possible and for teaching the mothers infant care. The physicians or midwives attending births and, in cases of unattended births, the fathers or other relatives must report the births within three days.

In Cuba a convention of specially elected delegates of the people adopted a new constitution which is the first in that country to authorize specifically an extensive program of family welfare services, public education and protection of labour. The enactment of this program into law within a specified period is made mandatory by the constitution.

Paraguay, too, has a new constitution. Although of lesser social import than that of Cuba, it is more advanced than the constitution of 1870 which it has replaced. Among the fundamental duties of the state, the constitution names social aid, care of the population's health and education of young people. (*See* also CHILD LABOUR: SOCIAL SECURITY.)

(K. F. L.)

Chile, a republic on the west coast of South America, extending some 2,800mi. from just within the tropics to the subarctic south; language, Spanish; capital, Santiago; president, Pedro Aguirre Cerda. The area is 289,776 sq.mi. The population (Nov. 28, 1940 census) is 5,000,782. Santiago has a population of 875,790 (Jan. 1, 1940 official estimate); other important cities (1939 est. pop.) are: Valparaiso, the principal port, 263,228; Concepción, 77,589; Antofagasta, 53,591; Viña del Mar, 49,488; Iquique, 46,458.

History.—Chilean internal political history during 1940 was concerned, in the main, with partisan political activities, in which, usually, the popular front (government) coalition of Radicals, *Demócratas,* Socialists, communists and other minor leftist groups was pitted against a rightist opposition embracing the Conservative, Liberal, *Democrático* and lesser parties. Jorge Gonzáles von Marées' Popular Socialist vanguard (formerly the Chilean nazi party), which, although not part of the popular front, had supported its ticket in the 1938 presidential elections, played a lone hand, with the violent fervour and fanaticism of its members making up for lack of numbers. Other independent groups included the fascist nationalists.

Despite the weaknesses inherent in coalition, the popular front administration of Pres. Aguirre struggled through the year against the rightist-controlled congress as well as against internal frictions, which brought about, in the course of the year, frequent shifts in cabinet personnel. The first, in February, resulted from a scandal arising from the sale, by Chilean consuls in Europe, of false passports to Jewish refugees, and a newspaper strike which left Santiago without newspapers for three days, and precipitated the resignations of six radical ministers. Continued strikes brought an increasing opposition from more moderate government supporters, particularly Pres. Aguirre's fellow radicals, and in June the president formally urged employers and employees to refrain from lockouts and strikes.

Anti-communist feeling mounted during 1940, and in November, legislation outlawing the party was approved by the chamber of deputies. Vigorous attacks on the communist party were made by Socialist leaders in December, notably by Minister of Development Oscar Schnake, who had just returned from a mission in the United States. Schnake, one of Chile's strongest political figures, and former president Marmaduque Grove, another leading Socialist, urged a Pan-American front against all totalitarian ideologies. Pres. Aguirre congratulated Schnake, but other radical leaders defended the communists as loyal members of the popular front.

Meanwhile, on Nov. 18, the popular front won its 15th consecutive by-election in less than two years. Voting, however, was seriously marred by disorders, and the election had far-reaching consequences, as the rightist-controlled congress impeached Interior Minister Guillermo Labarca and forced his removal for failure to preserve order. The parties of the right followed this by announcing refusal to participate in the regular congressional elections of March 1941, declaring the government gave the opposition no protection. Announcement by the new interior minister, Arturo Olavarria, upon taking office Dec. 23, that no strikes would be permitted to extend beyond ten days and all agricultural strikes would be barred until after harvest, coupled with his determined stand against non-governmental armed groups, whether of right or of left, coming as it did with the anti-communist drive, was regarded by many as indicating the imminent collapse of the popular front.

Fifth-column activities of German residents and German-descended citizens in Chile received wide attention both at home and abroad, amid charges that from $50,000 to $100,000 was being spent monthly on nazi propaganda. Many Chileans expressed alarm over extensive foreign, especially German, ownership of land along the border in southern Chile. The Socialist party, however, protested a government decree of Aug. 17 giving the national police power to deal with "professional agitators." In the last months of 1940 the vanguard and other agitator groups were especially active. Nevertheless, in view of the strength of Chilean national feeling, some foreign observers were inclined to regard the extent of "fifth columnism" as somewhat exaggerated.

To cope with unsatisfactory internal political and economic conditions resulting from the European war, a presidential decree of June 3 set up strict control of copper, iron, scrap iron, an livestock exports, along with measures to speed up agricultur and industrial production. Serious shortage of dollar exchang alleviated by a $12,000,000 United States Export and Impo bank credit in July, was again so acute that bond amortizatio payments were temporarily suspended on Dec. 3.

Especially after June, Chile undertook strong defence measure with emphasis on aviation. A 9,000,000 peso appropriation fo army training planes was made; 12 combat planes were pu chased, and a 600,000,000 peso development of air defence facil ties begun. Reports of United States negotiations for naval bas rights in Chile as part of its hemisphere defence program brough a quite unfavourable reaction, owing to feared infringement upo national sovereignty.

Chilean international relations during 1940 were concerne principally with Spain, the European belligerents, western hem sphere defence and territorial questions with Argentina. Only th Spanish question became an internal political issue. Relation with Spain, strained ever since the advent of the Franco regime t power, became increasingly tense in Jan. 1940, owing to Franco demands that several Spanish Republicans, refugees in the Chilea embassy in Madrid, be surrendered to his government, and o July 17 (on the eve of the Havana conference) Spain suddenl broke off diplomatic relations. Chilean interests in Spain wer handled by Brazil until, on Oct. 12, Spain made a unilateral an nouncement of resumption of relations.

Several incidents during the year served to irritate relation with Germany. German protests in January against the filn *Nurse Edith Cavell* forced deletion of several objectionable fea tures. Subsequent protests against continued recognition o Polish, Danish and Norwegian diplomatic representatives wer rejected, while arrest of four seamen from the German battleshi "Graf Spee," who had escaped from internment in Argentina caused the expulsion of the German consul at Valparaiso, who ha provided them with false passports.

The Chilean government, on the whole, maintained a rigorou neutrality toward the European war, refusing (Jan. 18) to adher to a joint Pan-American protest against Russia's invasion o Finland. The rightist senate, however, passed a resolution con demning invasion of neutral countries (May 15). The administra tion itself was loath to take any stand, and at the Havana confer ence opposed the proposed protectorate over European posses sions in America as "premature" (*see* HISPANIC AMERICA AN THE EUROPEAN WAR). Relations with the United States were gen erally quite friendly, however.

The Beagle channel boundary dispute with Argentina (involvin title to Picton, Nueva and Lennox islands), whose arbitration pro cedure itself became the subject of disagreement, was resubmitte to United States arbitration in May. A further dispute was in th offing as a result of formal Chilean assertion of rights over all o Antarctica between 53° and 90° W. long., which potentially af fected Argentine, British, Norwegian and United States claims.

Education.—Primary education is free, non-sectarian and com pulsory. Chile had in 1940 more than 3,504 public primary (193 enrolment, 460,715) and 820 private primary schools (enrolment 97,177); and 85 secondary (including the military and nava schools) and 119 special schools. There are four universities: th National at Santiago, two private and one parochial, with 7.00 students. The National university summer session (1940 enrol ment, nearly 1,000), held each January, is a mecca for student from all parts of America.

Army and Navy.—Chile has an army of 40,913, with reserve of 212,000 and an air force of 100 planes (aviation personnel 2,962). In Aug. 1940, 200 bombing, pursuit and training plane were ordered as part of the defence improvement program. Th

ıvy is one of South America's strongest. There are two naval ıses: Talcahuano (the more important) and Viña del Mar.

Finances.—The monetary unit is the peso, with an officially ntrolled value of 5.18 cents U.S. In the open market, however, fluctuated in terms of the dollar from 2.7 cents to 3.4 cents dur- g 1940. For foreign trade statistics, the gold peso (equal to gold, or 20.6 cents U.S.) is used. The total foreign debt (Dec. 40) was approximately $306,505,026, of which $170,208,500 as in dollar bonds, $111,049,884 in sterling and $25,246,642 in viss francs. All were in default, but during 1940, $6,215,500 was plied against the dollar debt under amortization arrangements spended on Dec. 3. The 1941 budget anticipated receipts of 909,750,359 pesos and expenditures of 1,909,502,618 pesos.

Trade and Communication.—Chile has extensive steamship nnections with all parts of the world, including direct service nder the Chilean flag to New York, to Guayaquil and to the east ast of South America (by way of Magellan strait). Air trans- rt service to all parts of America is provided by Pan American irways and its affiliates, with three direct connections weekly to d from New York. Air transport to Europe, through Argentina d Brazil, was formerly maintained by a German line (suspended Sept. 1939) and a French line, which ceased operations in 1940. ne former resumed flights in March 1940, but discontinued in ptember. There is railway communication to Bolivia from the rthern ports of Arica and Antofagasta. Under the new trans- ntinental railway project begun in 1940, the former was to be acific terminus of an Arica to Santos (Brazil) railway. (*See* OLIVIA.) Rail-bus service to Argentina is through the Transan- ne railway route and by way of Bariloche in the south.

Internal communication is by rail, coastwise shipping, air and ghway. The state-owned railway system extends south to uerto Montt, with a narrow-gauge line on the island of Chiloé. A tal of 8,387 km. of railway was in operation in 1940. During e year, new equipment of German manufacture (purchased be- re Sept. 1939) was brought through the British blockade with ecial permission of the British government. Orders for further uipment were placed in the United States.

Communication to the far south is by air (via Argentina) and boat. Internal air transport is well developed under a state- wned system, with routes nearly 5,000km. in length. The high- ay system, over 23,000mi. in length, including 9,500mi. of im- roved highway, is being rapidly developed, although it is inade- uate as yet. The Chilean merchant marine, officered and manned Chileans, is the largest and best developed in Hispanic Amer- a.

Chile's foreign trade in 1939 declined 8·7% from that of 1938. nports of 410,832,800 gold pesos were 17·7% less, exports of 71,365,000 gold pesos, 2·1%. Imports (with textiles, machinery, emicals, metal products, foodstuffs and miscellaneous manu- ctures leading) came largely from the United States (31·1%); ermany (22·7%); Great Britain (8·3%); Peru (7·5%); Argen- na (4·4%); Italy (3·9%); Japan (3·8%); France (2·3%), with roportions to each substantially the same as in 1938. Exports ere taken chiefly by the United States, 30·5% (1938: 15·7%); reat Britain, 12·3% (1938: 21·8%); Germany, 8·4% (1938: 5%); France, 4·7% (1938: 4·5%); Sweden, 4·6% (1938: 1%); Belgium, 4·5% (1938: 7·8%); Italy, 3·7% (1938: 4%).

In 1939, copper aggregated 49·3% of all export values; nitrate, 8·9% (48·2% and 20·7% in 1938). Nitrate exports in 1940 were xpected to be double the 1939 volume. Copper exports nearly oubled in the first eight months of 1940. Entry of Italy, a heavy ustomer, into the war, and lack of transportation facilities ere believed to have materially reduced the total before the end f the year, although considerable "back door" copper export to ermany was carried on through Japan.

In the first eight months of 1940 imports were 318,958,000 gold pesos (a 15·85% increase over 1939), with 47% from the United States (1939: 28·5%); Great Britain, 9·0% (1939: 8·6%); Peru, 8% (1939: 7·05%); Argentina, 5·95% (1939: 4·22%); and Germany, 4·6% (1939: 26·6%). Exports were 517,764,300 gold pesos (a 9·2% increase), 57·1% going to the United States (1939: 16·6%); Great Britain, 6·75% (1939: 18·65%); Italy, 4·0% (1939: 3·24%); Japan, 3·44% (1939: 1·55%); and Argentina, 2·32% (1939: 1·78%), following in order.

Agriculture and Mining.—Copper is the most important mineral product, with nitrates second. These two are the major export commodities, with production dependent upon export demand. Copper production in 1939 was 339,173 tons, 3·5% less than in 1938, but rose nearly 20% in the first eight months of 1940. Nitrate production (1,445,999 tons in 1939) rose nearly 7%. Other 1939 mineral production included iron, 1,625,622 tons; coal, 1,882,206 tons; gold, 10,110kgs.; silver, 36,517kgs. In 1940, 64,700 persons were engaged in mining.

Although minerals are the chief exports, agriculture is the principal industry, with most of its products mainly for domestic consumption. Wheat and fruits are the principal commodities. Chilean wine is becoming increasingly important.

The pastoral industry has increased notably in recent years, with its centre in the far south, where sheep are extensively raised. Wool exports are important.

Manufacturing.—Manufacturing is insufficient for domestic demands, but increased rapidly as a result of the European war's disruption of normal external trade channels. In the first eight months of 1940 the industrial production average was 12% more than that for the corresponding period in 1939. The most marked increases were in the output of glass, cement, matches, clothing and paper, whose domestic production averaged almost 50% higher than in 1939. From the point of view of employment, public utility services, foodstuffs, paper manufacturing and metal work are the most important industries.

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China, an ancient nation but a young republic, constituted, before the Manchurian crisis in Sept. 1931, an empire of 4,480,992 sq.mi. with a population of approximately 450,000,000. According to the final draft of the constitution promulgated in May 1936, China consisted of 28 provinces, Outer Mongolia and Tibet. Excluding Outer Mongolia, Tibet proper and Manchuria, over which China has *de jure* but not *de facto* control, China has an area of 2,903,475sq.mi. with a population of some 400,000,000. Since 1933, Japan has created Manchoukuo out of the provinces of Manchuria and Jehol. Since July 1937, Japan has penetrated 15 of the 28 provinces, viz., Hop-eh, Shantung, Shansi, Kiangsu, Suiyuan, Chahar, Anhwei, Hupeh, Fukien, Chekiang, Kiangsi, Hunan, Kwangtung, Honan and Kwangsi, but in Oct. 1940 withdrew its troops from Kwangsi and its occupation of the 14 provinces is far from complete. The occupied territories, including the special zones of North China and Inner Mongolia, are supposed to be administered by Wang Ching-wei's government at Nanking. Amoy and Hainan were in 1940 directly controlled by Japan.

In addition to the unoccupied area of the 14 provinces, 10 provinces, viz., Yunnan, Szechuan, Shensi, Kansu, Sikang, Chinghai, Ningsia, Kweichow, Sinkiang and Kwangsi, were in 1940 exclusively subject to the National government of China with its capital at Chungking. This area, currently termed "Free China," includes one of China's richest agricultural and productive salt well regions, and contains large deposits of coal, the bulk of China's resources of manganese, copper, lead, zinc, tungsten, antimony and tin, plus some gold and silver. The important iron, coal and

salt deposits and cotton and wool producing areas are in the northern provinces which Japan seeks to control.

Government and Politics.—China was ruled by dynasties prior to the founding of the Chinese republic in 1911. The republic has had a checkered history, and from 1927–37 China was ruled by one party, the Kuomintang. Since the war with Japan the minor parties, communist, Social Democratic, National Socialist, Young China, National Salvationists and Third party, have gained their legal status and a voice in the government.

The National government derives its mandate from the central executive and central supervisory committees of the Kuomintang, but the actual governmental functions are carried on by five independent departments or Yuan: executive, legislative, judicial, control and examination. The Central Political council, the highest political organ of the government in peacetime, formed a link between the Kuomintang and the government, but since Feb. 1939 the Supreme National Defence council has taken over all its peacetime functions and assumed emergency powers. Independent of the five Yuan, but subordinate to the National government, is the National Military council whose chairman, General Chiang, has the power to declare war, make peace and conclude treaties. The People's Political council, created in 1938, which had the power to make proposals to and inquiries of the government, and which formerly consisted of 200 members appointed by the Kuomintang, is, according to the announcement of Sept. 25, 1940, to be increased to 220 members, of which 90 are to be elected by the provincial and municipal political councils. The National People's congress scheduled for Nov. 12, 1940, to adopt the permanent constitution, was postponed, but limited legislative powers are given to the People's Political council, making it a more representative body during the war. Lin Sen, president of China, was in 1940 titular head of the government. (*See* CHIANG KAI-SHEK.)

Army.—The modern Chinese army, which dates its origin to the Nationalist army of 1925, has been an important factor in China's national life. In 1937 all of the military forces were subordinated to the National government, and at the outbreak of the war with Japan China had about 2,000,000 soldiers, with 1 trained reserves. The system of centrally directed conscripti and training did not begin until 1937. In 1940 the regular arm the guerrillas, and the partisan fighters consisted of about 2,50 000. About an equal number were serving in the militia. Due the historical development and different military tactics Chin army consisted in 1940 of two distinct groups: the Kuominta armies, including the Central army, the Kwangsi and other provi cial troops, and the Red army consisting of the Eighth Rou army and the New Fourth army. The Central army and t Kwangsi troops were better equipped for positional warfare, wh the Red army was known for its mobile tactics. The Natior Military council is the highest organ of the army which cons tuted in 1940 about 200 divisions. These divisions were organiz into 50 armies.

WANG CHING-WEI (front row, centre) and members of his Japanese-domina government. Wang set up his puppet rule at Nanking March 30, 1940, pledged assistance to Tokyo in trying to "restore peace" to China

Education and Religion.—Illiteracy is high, but steady pro ress has been made. It was recently estimated that out of 45 000,000 only 90,000,000 are literate and that adult illiterates nu ber 140,000,000. In April 1940, the ministry of education adopt a five-year plan for adult illiterates. The total number of t children of primary school age is about 45,000,000, but only 44 (19,800,000) are in school. Before the war there were about 29 000 primary schools, of which one-third were forced to close b cause of the war. In 1940 there were approximately 200,000 p mary schools and the ministry of education planned to increa the number to 800,000 within the five-year period (1940–44). the 3,264 high schools in China, about 40% (1,296) were in t occupied areas. The institutions of higher education have be severely crippled by the war. Out of a total of 108 colleges, have been either occupied or damaged and 14 have been co pletely destroyed. China saved 91 and moved 77 to a safe ar and four new ones were established. Special vocational scho were created to train administrative and technical personnel local administration and rural rehabilitation. Moral educati which is based upon Confucian virtues and the three principles the people, is emphasized.

The Chinese are eclectic and the average Chinese is influenc by Confucianism, Buddhism and Taoism. There were in 19 approximately 1,000,000 Protestants, 2,000,000 Catholics a 48,000,000 Mohammedans in China.

Finance and Banking.—An agricultural economy, the loss territory and the problem of national currency and internatior exchange have made China's financial problem exceedingly di cult. The 1940 budget was expected to be much higher than t announced budget of 2,850,000,000 yuan of 1939, which was 75 000,000 yuan over the budget of 1937. China's chief sources revenue had been the maritime customs, the salt monopoly a consolidated taxes, but Japanese occupation of seaports, salt p ducing centres and industrial areas has deprived China of mu of these. China's revenue since 1938 is estimated at 100,000,c yuan per month, approximately one-half her expenditures. N taxes on income, inheritance and war excess profits have be levied, but with slight success. The government has issued bor and negotiated loans to meet the deficit. Up to July 1940, t domestic loans floated since July 1937 amounted to 3,430,000,c yuan; 100,000,000 custom gold units; £20,000,000 sterling a U.S. $100,000,000. The largest foreign credit up to 1940 ca from soviet Russia and amounted to $200,000,000–$250,000,0 The United States advanced $25,000,000 in Dec. 1938, $20,000,c in March, $25,000,000 in September and $100,000,000 in Nove ber of 1940. In 1939 Great Britain extended £5,000,000, a £10,000,000 in Dec. 1940, for currency stabilization.

At the beginning of the war with Japan, China had a stable currency with the yuan at 30 U.S. cents. Shortly after the outbreak of hostilities the Chinese dollar declined until May 1940, when it reached 4.65 cents. In early December it had recovered to 6.10 cents. The four government banks have issued and circulated notes, fully backed by cash reserves and securities, totalling 1,407,202,334 yuan in June 1937, and increased to 3,962,144,205 yuan by June 1940. Prices have risen five- to eightfold because of the disruption of transport facilities, expensive means of transport, general shortage of certain commodities, hoarding and currency depreciation.

Trade, Transportation and Economic Development.—China has always had a heavy import surplus. China's receipts from other services and exports are not sufficient to counterbalance the combined total of the import surplus and of interest payments abroad. Its principal export articles are: silk, tea, wood-oil, bristles, hides, eggs and egg products, tungsten, antimony, tin and handicraft goods, and her principal imports are manufactured goods, machinery, chemical products and war supplies. In 1937 China's import excess was about 115,000,000 yuan, and 2,411,000,000 yuan in 1939. The excess imports between January and July of 1940 were 93,684,000 as against 349,612,000 yuan in the same period of 1939. If the volume of trade in "Free China" is separated from that of the occupied area, an increase in the volume of import trade is observed in the occupied area because of the loss of ports. In "Free China" there has been an export surplus. In order to conserve foreign exchange the National government adopted measures to promote production, encourage exportation and restrict certain imports.

To facilitate exports and the importation of war supplies China completed, since 1937, the Burma road, the Turkistan-Siberian road and some 5,700km. of new highways in the interior. Japanese occupation has deprived the National government of about 7,300km. of railway, but China has undertaken the construction of approximately 7,000km. of railway. Because of financial and economic difficulties, only about 600 km. have been completed. Progress has also been made in commercial aviation, telegraph and telephone in "Free China." China's coastal and river shipping was practically wiped out by the war. China has no transoceanic shipping line.

Despite difficulties, the National government carried on its program of developing heavy industries in the rear. More than 472 factories have been moved from the coastal provinces to Szechuan, Yunnan and Kweichow. The ministry of economic affairs has constructed mining and metallurgical industries, machinery and electrical industries, chemical industries, spinning mills and power plants. To improve agricultural production of essential goods the National government allocated from June 1939 to Feb. 1940, 151,000,000 yuan for loans to the farmers of "Free China," and rural co-operatives are being organized on a large scale in order to improve agricultural methods and production.

Destruction of Chinese industrial equipment, blocking of China from foreign trade sources and encouragement of Japanese exports to Chinese markets gave incentive to the organization of industrial co-operatives. In July 1938, the National government inaugurated the industrial co-operatives initiated by both Chinese and foreigners by granting them an initial capital of 5,000,000 yuan. They aimed to establish 3,000 producers' co-operatives in the interior. In April 1940, the number of organizations exceeded 1,500. These are organized around some 60 depots in about 16 provinces. The central headquarters is at Chungking and the staff of 700 is financed by government funds. The co-operatives were employing in 1940 more than 25,000 members with a monthly turnover of about 600,000 yuan. They represented over 100 trades and produced 250 different commodities: from boots to boats and candles to light bulbs. The development of the industrial co-operative is one of the important features of China's war economy. (*See* also CHINESE-JAPANESE WAR.)

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Chinese-Japanese War.

The Chinese-Japanese war which began on July 7, 1937, entered its fourth year. The immediate cause which set the spark to one of history's most brutal dramas was a night skirmish near the Marco Polo bridge on the outskirts of Peking, capital of dead dynasties and old governments of China. The fundamental forces motivating the war were patent in the "Manchurian incident" of Sept. 18, 1931; viz., the culmination of the struggle between Chinese nationalism and Japan's policy of expansion, and the beginning of an open conflict between the assertion of Japanese hegemony in eastern Asia and the struggle of the western democracies to maintain the *status quo* in that area. In terms of destruction of life and property and of suffering, the Chinese-Japanese war was by the end of 1940 already comparable to the war of 1914–18 and the end was not in sight. After the Japanese invasion of French Indo-China in Sept. 1940 and the signing of the Berlin-Rome-Tokyo tripartite alliance in the same month, the international character of the Chinese-Japanese war became more obvious, and the outcome and course of the Chinese-Japanese war and the European war seemed interdependent.

Military Operations.—The Chinese divide the military developments of the war into three stages: Japanese offensive and Chinese defensive; guerrilla warfare and stalemate; Chinese counteroffensive and Japanese retrograde movement. The first stage of Japanese offensive and Chinese defensive can be divided into three periods. Each of the three periods of the first stage was marked by the fall of a strategic city: Nanking in Dec. 1937; Hsuchowfu in May 1938; Hankow in Oct. 1938. With the fall of Hankow General Chiang Kai-shek adopted general guerrilla warfare against Japan. This marked the beginning of the second stage of the war in 1940.

The Japanese fundamental objective was either to annihilate China by taking her nerve centres and dealing a deathblow to her army or to strangle China by cutting her off from the outside world and dividing her internally. The Chinese fundamental objective was to defend the important and strategic cities as long as possible in order to make the Japanese advance costly and to gain time by losing area. Thus it was to Japan's advantage to win a decisive and swift war, whereas China's hope lay in a war of attrition. During 1940 China's chief objective was to prevent Japanese consolidation and control of China by political means and to prevent Japan from conquering China by the use of Chinese resources. Japan's main objectives were to consolidate her economic and political gains, to harass Chinese forces, to bomb Chinese bases and lines of communication and to tighten the blockade. From the fall of Hankow to Dec. 1939, Japan succeeded in taking only two important inland towns, Nan-Chang and Nanning. Off the southwestern coast of China, Japan occupied the minor ports of Hai-Chow, Weichow and Swatow and Hainan and the Spratley islands. Japan failed to control Shansi, to strike at Ningsia and the Russian-China supply line through Lanchow and to secure complete control of the Chang-chow-Hankow and Canton-Hankow railways. Japan suffered a major setback in her drive to Chang-sha in Oct. 1939. It was estimated

that in the first year of war Japan penetrated China to a depth of over 1,000mi.; in the second year, about 200mi.; and in the third year, only slightly over 100mi. During 1940 China recaptured many towns from the Japanese.

Through the year 1940 the military situation was largely a deadlock and neither Japan nor China was able to force a definite conclusion on its own terms. Because of her southward move and of the economic strain of the war, Japan was more anxious to conclude the conflict than China, and the failure to settle the "China incident" was the chief cause of the frequent changes of governments in Japan. Since the beginning of the war the Japanese cabinet changed five times. In order to establish the "new order" in "greater east Asia" Premier Konoye created the New National structure which penetrated every aspect of national life and was designed to give Japan the strength of totalitarian organization without the machinery of single party rule. On the other hand, the Chinese united front was maintained and strengthened in order to continue the policy of continued resistance.

Chinese and Japanese military objectives and tactics remained unchanged through 1940. There were many engagements on three main fronts: the northern front, including the five northern provinces; the central front, covering part of Hupeh, Hunan, Kiangsi, Chekiang and Kiang-su; the southern front running through parts of Kwangtung and Kwangsi. On the northern front Japan continued her offensive in Shansi and Suiyuan with the purpose of invading Ningsia, Kansu and Chinghai via the southern half of Suiyuan, in order to establish a puppet government in Inner Mongolia and to cut off the routes between China and soviet Russia. In Jan. 1940, Japan took the strategic city of Wu-yuan and reached the border of Ningsia, but in March China recaptured Wu-yuan, forcing Japan to retreat to Paotow. At the end of April Chinese troops forced their way into part of Kaifêng, Honan province, but they were immediately driven out. Taking advantage of Japanese concentration of troops in the south, the Chinese prepared a counteroffensive in July. With t co-operation of the peasants the guerrillas mobilized about 10 000 men to attack the Japanese lines. In August they succeed in cutting north China's main communication lines, in annihil ing Japanese outposts and garrisons along the communicati arteries, and in preventing Japan from concentrating her for for major operations on the northern front.

Having failed in the drive on the northern front, Japan launch a big offensive on the central front in May 1940 with the purpo of destroying the strong Chinese forces concentrated in the up Yangtze valley, cutting off the Chinese connection between no and south China and either crushing the national government reducing it to the status of a local regime in southwestern Chi In June pitched battles were fought around Siang-Yang a Ichang, the gateway to eastern Szechuan from Hupeh, and casu ties were heavy on both sides. Japan's attempt to surround a destroy the Chinese armies was unsuccessful but she succeeded capturing two exceptionally valuable strategical cities, Ichang a Shasi, toward the end of June. Ichang is about 240mi. closer Chungking than is Hankow, the base for all former air raids the wartime capital, and from May to November Chungking w constantly subject to intensive air raids. Toward the end November Japan's Hupeh offensive met another setback. The were indications that the Japanese forces in central China wou have to withdraw from a number of advanced positions to th main bases of concentration.

On the southern front, after taking Nanning in Nov. 19 Japan began to drive toward northern Kwangtung and Kwan with a view to penetrate Yunnan and block China's access to Ind China and Burma and to prepare a military base against t French colony. In Feb. 1940 the Japanese offensive in northe Kwangtung failed with heavy casualties. In the middle of Febr ary China recaptured Pinyang, the northernmost Japanese outpo in Kwangsi. The occupation of Nanning not only cut one

China's wartime supply routes but also provided Japan with a closer base from which to bomb the Indo-China Yunnan railway, and from January to June the Chinese section of the railway was repeatedly bombed despite the promise of the French government to stop the Chinese from shipping munitions by that line. In June, during the Nazi attack on Paris, Japan brought pressure on France and Britain to close China's international trade routes. Japan's attempts to cut China's international lines of trade and supply were more successful than her military offensives.

Japan's design on Indo-China was first regarded as the attempt to attack Yunnan through the Indo-China Yunnan railway, but subsequent military operations in Indo-China indicated it to be a prelude to southward expansion. Because of the desolate mountains, it was difficult for Japan to invade Yunnan by way of Indo-China or Kwangsi. However, Japan used her newly-acquired air bases in Tongking to bomb the Burma road, Kunming and other important centres in southwestern China. Toward the end of Oct. 1940, Japanese troops withdrew from Nanning and all military posts in Kwangsi due to: Chinese military pressure; Japan's strategy of shortening her defence lines in the coastal region; and Japan's attempt to gain military advantages in the southern Pacific. In November Japan concentrated large forces at Hai-phong, Kwangchow-wan and on the Hainan island and Formosa for the southward drive.

Cost of the War.—At a great cost of money and men Japan penetrated 15 Chinese provinces and occupied fully or partly 551 of China's hsien (counties) and 15 of China's 23 municipalities. Tenuously Japan controlled about 500,000 sq.mi. of China and 80% or 90% of China's prewar railways. She controlled practically all the important coast ports and the main waterways. She forced the closure of the Indo-China Yunnan railway and of Hongkong, seized the main part of the customs revenue and forced Great Britain to close the Burma road for three months. Chinese casualties were very high and no less than 2,000,000 soldiers and 3,000,000 civilians lost their lives. Millions of people were uprooted and more than 30,000,000 became refugees.

The Japanese army admitted they lost over 100,000 men; Chinese military headquarters placed the figure of casualties as high as 1,800,000 and neutral observers at 700,000 to 800,000. Japan mobilized and dispatched to the Chinese fronts over 1,000,000 men. About two-thirds of Japan's land forces, 75% of her army air force and a considerable part of her navy were tied up in the Chinese campaign. Moreover, Japan found herself in economic difficulties. She had spent about 16,000,000,000 yen on the war and her government financial budget increased from about 5,000.000,000 yen in 1937–38 to 10,500,000,000 yen in 1940–41. The supplementary war budget for the period of hostilities amounted to 12,000,000,000 yen. According to Finance Minister Kawado, Japan's note issue in 1940 went up from 3,810,000,000 yen to 4,540,000,000 yen. Her foreign trade fell off. It was estimated that Japan's national debt increased from about 10,500,000,000 yen in 1937 to 28,000,000,000 yen in 1940. The heavy burden of the war, the high cost of living, the various taxes and levies, the restrictions of output in the light industries, the policy of price-fixing, the dearth of agricultural products and the shortage of coal, fuel, sugar and rice were all seriously depressing the standard of living of the Japanese people. There were indications of discontent and growing anti-war sentiment among the Japanese people. It did not seem that Japan could attain her objectives by military force alone.

Economic and Financial War.—Japan's purpose was to crush China's economic resistance and, wherever possible, to exploit Chinese resources for the military campaign against China. The immediate objectives expressed in the resolutions adopted in Oct. 1939 by the Japanese Asia Rehabilitation administration were as follows: to confiscate large Chinese industrial enterprises in the occupied areas and to incorporate small ones under the name of joint ownership; to control all raw materials and develop resources for the military supply of Japanese garrisons; to forbid the use of Chinese legal tender in central China; and to establish free exchange between the new currency of north China and central China. These resolutions were carried out and two companies (the North China Development company and the Central China Development company) were established by the Central Board of East Asiatic Affairs in Tokyo to push the trade and industrial activities and monopolies in the occupied territories.

In order to undermine Chinese national currency and to weaken the confidence of the Chinese in the national government, Japan created the Federal bank in Peking and the Hua Hsing bank in Shanghai and introduced military notes throughout the war-torn districts in China. The Japanese-sponsored currency was not, however, powerful enough to supersede the legal tender issued by the four banks of the national government. In Nov. 1940, Japan took control of the Central Bank of China in Shanghai and in December the Japanese-sponsored government at Nanking authorized the establishment of a Central Reserve bank which will float a huge new currency issue, similar to the Chungking government's notes. By such measures Japan expected to undermine the Chinese national dollar and to extend the authority of the Nanking government over currency throughout the occupied areas. Toward the end of 1940 Japan's note issue reached 4,540,000,000 yen and China's was estimated to be over 6,000,000,000 yuan. Since both the Japanese and Chinese prewar note circulations were on the same level, China's note issue exceeded the Japanese. Chinese currency is backed up by cash reserves and securities and according to the statement of the Chinese finance minister British and American loans have raised China's foreign exchange reserve fund by 50%. The Chinese dollar, which was worth almost 30 American cents before the Chinese-Japanese war, was quoted at less than six cents on Dec. 31, 1940, while the Japanese yen was artificially maintained at about 23½ cents. However, in free markets at Shanghai the Japanese yen has often fallen below the value of the Chinese dollar. The governments of the United States and Great Britain adhered to the view that the Chinese dollar is the sole legal tender currency in China.

China's economic defence measures were planned to establish new economic bases in the southwestern provinces, to improve international trade routes (*see* CHINA), to control foreign exchange and to blockade Japan economically. Three emergency measures were adopted to carry out the last measure. In Aug. 1939, the national government prohibited the smuggling of articles to the enemy which could be used to make munitions or as exports to foreign countries for foreign exchange. Secondly, goods manufactured in Japan, in Japanese colonies and in the occupied areas with Japanese capital were boycotted. Thirdly, the government extended guerrilla activities in order to obstruct, even destroy, as much as possible, Japan's schemes to develop the occupied territories. Together with the control of the leading export and import activities the national government adopted measures such as restricting the withdrawal of bank deposits, limiting the outflow of Chinese national currency, negotiating credit loans and barter agreements, government absorption of foreign exchange and centralized control of foreign exchange allocations for trade and other legitimate demands to protect its specie reserve and foreign exchange.

Japan's Political Offensive.—Simultaneously with the military offensives Japan used political weapons to destroy China's internal unity by creating a puppet central government and then by trying to subjugate China with the help of the Chinese themselves. After Japan formally notified the diplomatic representa-

tives of other powers at Tokyo in July 1938 that the Japanese government would withdraw its recognition of the national government of China, she began to look for a prominent Chinese to form a new central government. After the death of Wu Pei-fu in Dec. 1939, Wang Ching-wei, who was willing to accept Konoye's declaration of the three-point peace settlement of Dec. 1938, was chosen to head the new central government. In Dec. 1939, the draft agreement of the Sino-Japanese Treaty for Mutual Adjustment which made China virtually a Japanese protectorate was signed between Wang and Japan. In Jan. 1940, Wang asked General Chiang to end resistance and make peace. On March 30, the All China government which was an imitation of the Chungking government and actually confined to the occupied areas of Kiang-su, Chekiang and Anhwei was inaugurated at Nanking. Before the signing of the peace treaty Japan only acknowledged Wang's regime *de facto* and formal recognition was not granted until Nov. 30, 1940. The foreign minister at Chungking pronounced the new regime illegal, China threatened cessation of normal relations with any power recognizing the Wang regime, and the United States, Great Britain and soviet Russia declared Chungking to be the legitimate government of China.

Since the creation of the new regime at Nanking failed to secure the recognition of foreign powers and the support of the Chinese people, Japan could only bring about peace either by crushing Chinese resistance or by offering peace terms acceptable to the Chinese. The deterioration of the economic and financial situation, the unsatisfactory result of the exploitation in the occupied territories, the heavy cost of the revival of strong military action and the popular demand to bring hostilities to an end caused Japan to make, unofficially, fresh peace offers in July and Aug. 1940. In October, encouraged by Germany who wanted Japan to have a free hand for bigger adventures, Japan offered China more liberal terms. Having failed to approach Chungking, General Nobuyuki Abe, special envoy representing the emperor of Japan, signed the "peace treaty" with Wang. Japan recognized his regime as the "national government of the republic of China."

Europe and the Far East.—The conflict in Europe has had its effects in the far east. The conclusion of the anti-Comintern pact of Nov. 1936 and the Italian adhesion to the pact in Nov. 1937 weakened France and Britain in the far east and diminished Japanese fear of Russian intervention in the Sino-Japanese war. In Aug. 1939, when Germany concluded a nonaggression pact with Russia, the Japanese anti-Comintern policy was shattered. Befor the outbreak of the European war in 1939, irritation was caused i Tokyo by German aid to, and trade with, China. Japan stoppe this trade and tried to prevent China from receiving any aid fro the powers. Before the conclusion of the Berlin-Rome-Tokyo tri partite alliance Japan followed a policy of "non-involvement while the British and French tried to appease Japan and looke to the United States to keep Japan in check. As the effectiv strength of Britain and France in the far east declined, Japa extended its control and influence.

On June 19, 1940, Britain, yielding to Japanese demands for th right to dispose of the Chinese government's silver deposits t circulate the so-called Federal Reserve bank notes and to hav certain police power in the British and French concessions, signe an agreement with Japan to settle the two-year-old disputed issue at Tientsin. On June 20, the French ambassador at Tokyo signe a statement pledging respect for Japan's "military necessities" i China. The British ambassador used the same phrase in th Craigie-Arita formula of July 24, 1939. Immediately after thi statement France allowed Japanese inspectors to be stationed a Hanoi, Hai-phong and other points in Indo-China to examine th stocks of materials which might go to China. In Shanghai, i the latter part of June, French concession authorities surrendere a part of the International Settlement and the French concessio to Japan and permitted the Japanese army to extradite Chines suspects and participate in military searches within the conces sion. In November they handed Chinese courts to the Wan regime. In order to put pressure on Britain to close the Burm road, Japanese troops occupied the mainland north of Hong kong on June 22. In early July the British government an nounced its decision to shut off the transport of supplies throug Hongkong and to close the Burma road for a period of thre months, beginning July 18. In early August Britain withdrev the remaining British military forces at Shanghai, Tientsin an Peiping.

With the approbation of Germany and Italy the new Konoy regime proclaimed Japan's "new order" to include a "greater eas Asia" embracing Indo-China and the East Indies. Japan de manded from France the right to establish naval and militar bases in Indo-China, to move troops through this area and to se cure a new trade agreement favourable to Japanese interests. De spite the French acceptance of the demands on Sept. 22, the Japa nese south army invaded Indo-China on the following day. Ja pan's drive to southern Indo-China and to the south seas led to n

HUGE BILLOWS of smoke and dust rose over Chungking June 28, 1940, after a three-hour Japanese air raid

concrete action while hostilities and air raids between France and Thailand continued along the border of Indo-China. After the conclusion of the tripartite alliance, Japan tried to reach an agreement with Russia at China's expense. It has been soviet Russia's policy to protect its far eastern interests, to aid a resisting China and to avoid war with Japan. Since the Russian far eastern policy remained unchanged, negotiations for a general soviet-Japanese accord did not go beyond border disputes and the perennial fisheries question. Due to American and British warnings against a Japanese southward move it seemed doubtful in 1940 that Japan would undertake such a drive without a general understanding with Russia.

The United States and the Far East.—Japan's aggression in China constituted a threat to American interests in the far east. As Japan carried out her policy of aggression in China with vigour, the United States faced a choice between a compromise with Japan and firm resistance. Before Japan's invasion of Indo-China and the conclusion of the tripartite alliance, American action to stem the Japanese advance was limited to moral gestures, statements of policy, denunciations of Japanese bombings of civilians, disapproval of Japan's "new order," moral embargo and economic measures, such as the termination in Jan. 1940 of the treaty of commerce and navigation with Japan, the licence control since July of aircraft parts, metal-working machinery, aviation gasoline and iron and steel scrap of the Number 1 grade and small credit loans to China.

Since the United States had the power both to increase the strength of Chinese resistance and to cut off the supplies of oil, steel scrap and other war materials upon which Japan depended for the prosecution of the war, Japanese former foreign ministers Nomura and Arita in the Abe and Yonai cabinets made gestures to improve Japanese-American relations, but the situation became worse when Japan embarked on a policy of southward expansion and became a member of the axis.

Japan's drive to the south not only endangered the source of much of American rubber and tin but it also menaced the security of the Philippines. On April 17, 1940, Secretary Hull expressed American concern regarding maintenance of the *status quo* in the area of the Pacific and repeated the same statement on May 11 and Sept. 4. When the French-Japanese agreement of Sept. 22, which gave Japan a foothold in Indo-China, was disclosed, Secretary Hull stated that "the *status quo* is being upset and that this is being achieved under duress." On Sept. 27, Washington announced the embargo on all scrap metal to be effective on Oct. 16 and, in December, the export control extended to include steel and iron. On the same day the long overdue Berlin-Rome-Tokyo alliance was signed and the axis powers and Japan recognized and supported each other's leadership in the establishment of a "new order" in Europe and Asia. The purpose of this pact was to isolate Britain and to warn the United States but the result was just the opposite. Anglo-American co-operation in the far east was reinforced by further consideration of possible use by the United States of British naval and air bases in that area. Despite threatened reprisals Britain reopened the Burma road and extended a new loan to China. The United States took a firmer attitude toward Japan by extending new and larger loans to China, by sending naval and air reinforcements to Hawaii and the Philippines, by pronouncing the policy of aiding nations resisting aggressors and by advising American citizens to evacuate the far east. This last measure created a sobering effect on Japan and Admiral Nomura was selected as Japanese ambassador to the United States to follow a new policy of temporary appeasement. (*See* also ARMIES OF THE WORLD; FOREIGN MISSIONS; GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF; INTERNATIONAL LAW; UNITED STATES.)

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Chinese Turkestan: *see* SIN KIANG.

Chosen (Korea), a part of the Japanese empire, is a peninsula extending southward from the northeastern part of the continent of Asia. Its eastern coast faces the Sea of Japan, its western coast the Yellow sea; and it borders Manchoukuo and the maritime province of Siberia on the north. Area 85,206 sq.mi., including 1,018 islands. Population (Dec. 31, 1937) 22,355,485, including 629,512 Japanese and 43,118 other foreigners, mostly Chinese. The capital is Seoul (Keijo), population (1937) 706,396. Other cities: Fusan, 213,142 (1937); Phyöng-yang (Heijo), 185,419; Taikyû, 110,866. Governor general, General Jiro Minami (since 1936). The country is administered by the government-general, which is divided into a secretariat and the bureaus of internal affairs, finance, justice, industry, education, politics, communications, railways and monopolies. A central council, consisting of a president, vice-president, five advisers and 65 councillors, acts in an advisory capacity to the governor.

Education and Religion.—Chosen in 1937 had 4,740 schools of all kinds and 1,211,449 pupils. There are a number of foreign Christian mission schools in the country. There were 6,397 Korean students studying in Japan on Oct. 1, 1936. Prevalent forms of religion among the Koreans are Confucianism, Buddhism and Taoism. There were 489,626 Christians in Chosen in 1936.

Finances and Banking.—The unit of currency is the Japanese yen (worth 23.48 American cents in Dec. 1940). The Bank of Chosen is the central banking institution and there are nine other banks, including the Chosen Industrial bank and the Chosen Savings bank. Deposits in the Bank of Chosen in 1937 were 293,944,000 yen and deposits in seven ordinary banks (excluding the Chosen Industrial bank and the Chosen Savings bank) were 172,749,000 yen. The budget for 1939–40 was 643,217,000 yen.

Trade and Communications.—Chosen's foreign trade is mainly with Japan. Exports to Japan in 1938 were 710,540,000 yen and imports from Japan were 921,346,000 yen. (These figures include trade with all parts of the Japanese empire). Exports to foreign countries in the same year were 169,067,000 yen and imports were 134,583,000 yen.

There were 5,397.8 km. of railways and 27,731 km. of highways in Chosen in 1938. There were 1,134 steamers with a tonnage of 70,184 and 11,730 sailing boats with a tonnage of 150,473. There are three airports at Seoul, Phyöng-yang and Urusan and there is a meterological station at Urusan. The total length of telegraph and telephone lines is 8,863 km. and 11,115 km. respectively.

Agriculture, Manufactures, Minerals.—Chosen is predominantly an agricultural country, with rice as the most important crop, but manufacturing industry and mining have been making rapid progress. The value of agricultural production grew from 681,399,000 yen in 1929 to 1,303,016,000 yen in 1937. During the same period the value of industrial production increased from 327,007,000 yen to 959,308,000 yen and that of mining from 26,488,000 yen to about 150,000,000 yen. There have been considerable fluctuations in the rice crop, a bumper yield of about 120,000,000bu. in 1938 being followed by a crop of a little over 70,000,000bu. in 1939 as a result of drought. Other agricultural products include wheat, barley, soybeans, apples, cotton, sugar beets and silk. Gold is the most important mineral product, its value in 1936 (the last year when statistics were published) being 49,909,000 yen (then worth about $14,000,000). (W. H. CH.)

Christian X (1870–), King of Denmark, K.G., of whom a biographical account will be found in the *Encyclopædia Britannica,* vol. 5, p. 630, nephew of Queen Alexandra of Great Britain, succeeded his father, Frederick VIII, in 1912. He has been known for his horseback rides through Copenhagen and has been generally beloved by all classes of his people. The Germans made no move in 1940 to displace him. His 70th birthday (Sept. 26, 1940) was the occasion for popular demonstrations throughout the kingdom, and especially before Amalienborg palace, expressive of a deep national solidarity as well as personal love of the monarch. (F. D. S.)

Christian Science. Mary Baker Eddy issued her first and principal book on Christian Science, *Science and Health with Key to the Scriptures,* in 1875. She founded the Church of Christ, Scientist, at Boston in 1879, as a church "which should reinstate primitive Christianity and its lost element of healing" (*Church Manual,* p. 17). By 1940 this denomination had spread to all countries where English is spoken and to other countries on all continents of the world. Authorized Christian Science literature was published to different extents in 17 languages. It included periodicals in the English, French, German, Dutch and Scandinavian languages.

Christian Science, as an individual interest and as an organized religion, has progressed steadily from its beginning. This progress continued in 1940 but was somewhat hindered then by the conditions incident to war. Wartime conditions also furnished opportunities for wartime helpfulness. These opportunities the Christian Scientists have accepted in increasing measure, as permitted by the many pertinent laws and regulations. For instance, the Christian Science Mother Church (The First Church of Christ, Scientist, in Boston, Mass.) supplied "officiating chaplains" for British army camps and this Church's War Relief Committee collected and forwarded large quantities of clothing to British sufferers from the war.

The *Christian Science Monitor* (international daily newspaper) has its own European news service besides that which it gets through membership in the Associated Press. The Christian Science denomination (Dec. 1, 1940) included 2,858 churches and societies, besides many Christian Scientists living where local congregations are not yet organized. There were 2,177 churches and societies in the United States, 319 in Great Britain, 88 in Germany and 274 in other countries, including those most distant from Boston (Australia, New Zealand and South Africa). There were 72 Christian Science Organizations at colleges or universities, of which 69 were in the United States. Over 11,000 practitioners were engaged in Christian Science healing in 1940. (C. P. S.)

Christian Unity. Marked progress took place in 1940 in the closer combination and strengthening of agencies in which the churches were already united. The assembly of the English Free Church council, meeting in April, completed the merger of two existing organizations, the Federal council and the Free Church council, thus creating a single common organ for the group. In the United States the Home Missions council and the Council of Women for Home Missions united in December. A Joint Field department has been maintained by six of the major national co-operative agencies, and representatives of these agencies have carried on formal conversations looking toward their unification, which were in 1940 expected to pass into the stage of active negotiations. The Protestant Episcopal Church, previously affiliated in only limited areas of activity, accepted full membership in the Federal Council of the Churches of Christ in America.

The confused state of the world complicated movements for church unity at numerous points. Thus, Japanese churches had long been looking toward unity on established lines, but had it arbitrarily forced upon them as a result of the drastic Religions bill requiring "all religions to fit into the framework of Japan's new national structure." Under this pressure the churches of Baptist, Congregational, Lutheran, Methodist, Presbyterian and United Brethren origins united on Oct. 17. The Anglican Japanese Church attempted to maintain independent existence and the government apparently accorded separate status to the Roman Catholic and Eastern Orthodox churches within the now legally recognized Christian group. Heightened racial tension in South Africa caused churches of African natives to withdraw from inclusive negotiations for unity in favour of a movement for an all-African church.

Discussion of unity was also accelerated by political circumstances. The unification of the German Free churches was actively discussed.

The piecemeal unification of denominations went forward, especially in the United States. The union of the United Brethren and Evangelical denominations was being submitted in final form to the minor jurisdictions of these churches. In discussions of the doctrinal basis for union among the three major Lutheran groups, agreement in principle seemed to have been reached, but without a common understanding as to the kind of union which should follow.

In connection with current negotiations between the Protestant Episcopal and the Presbyterian Church, U.S.A., a proposed concordat intended to provide "means whereby each church may, whenever it seems locally desirable, assume pastoral charge of members of the other church and offer them the privileges of the Holy Communion, thus establishing one congregation," was not pressed for action because of strong opposition in the convention of the Protestant Episcopal Church; but further negotiations were authorized.

Additional churches in Australia, Canada, England, Scotland, Switzerland and seven in the United States joined the World Council of Churches. The most notable of its new adherents was the Church of England. The activities of the World Council have gone forward continuously, its agents moving somewhat freely among the churches of all the belligerent and many of the occupied countries in ministries of encouragement and mutual aid, and in work for war prisoners and refugees. (H. P. D.)

Christopher, Prince (1888–1940), uncle of King George II of Greece, was born at the chateau of Pavlovsk near Leningrad (St. Petersburg) July 29, the son of King George I of Greece and the former Grand Duchess Olga of Russia. He received a military training and served in the Balkan wars. As a possible heir to the throne he was initiated into the duties of a ruler. On Feb. 1, 1920, he married Mrs. William Leeds, the widow of an American tin-plate manufacturer. She died Aug. 29, 1923. On Feb. 10, 1929, he married the daughter of the Duc de Guise, Orleans pretender to the French throne. He died in Athens, Jan. 21.

Chromite. World production of chromite declined materially in 1938 and 1939 from the high figure of 1937, and it remained to be seen to what extent European war demand in England and the United States is able to offset the decline caused by the loss of practically the entire continental market in Europe. No import figures were available in 1940 outside of the U.S., where, judging from the first 10 months' returns, the total for the year would probably exceed the record figure of 1937. Among the important producers, Turkey during the first quarter of 1940 remained at about the average for 1939; South Africa during

the first half showed a small increase over the 1939 average for production, but a decline of 45% in exports, part of which was due to loss of continental markets, and part to lack of shipping facilities; the greatest improvement was in Southern Rhodesia, where output during the first half almost equalled that for the whole of 1939, but no information was available on exports; the Philippines increased by more than one-third during the first half, as compared with the 1939 average, while Yugoslavia declined about one-fourth in the first quarter.

The Turkish government made a loan of £T.1,000,000 to the Eti bank, which will be used to assist chromite producers, by making loans on ore stored at export ports.

World Production of Chromite

(Metric tons)

	1929	1932	1937	1938	1939
Cuba	53,799	500	94,592	40,200	66,900
Greece	24,214	1,555	52,600	42,500	55,000?
India	50,361	18,190	63,300	44,800	?
Japan	9,163	12,492	?	?	?
New Caledonia	52,594	69,429	48,022	52,200	52,000?
Philippines	—	—	69,856	66,900	126,700
South Africa	63,974	19,371	168,600	176,600	160,000
So. Rhodesia	265,909	15,692	275,617	186,000	139,100
Turkey	16,178	55,196	192,508	213,600	210,000?
U. S. S. R.	52,889	62,100	?	?	?
Yugoslavia	43,022	43,925	59,932	58,500	44,100
Total	635,200	298,500	1,300,000?	1,050,000?	950,000?

The United States produces only a few hundred tons of chromite, but in 1937 imported 562,800 tons; in 1938 and 1939 imports dropped but recovered to 520,000 tons for the first 10 months of 1940. (G. A. Ro.)

Chromium: *see* METALLURGY.
Chronology: *see* CALENDAR OF EVENTS, 1940, PAGES 1–16.

Chrysler, Walter Percy (1875–1940), U.S. industrialist, was born in Wamego, Kan., April 2 and was educated in the high school at Ellis, in the same state. He began work as a machinist's apprentice in the railroad shops in Ellis. At the age of 33 he had risen to the post of superintendent of motive power and machinery of the Chicago and Great Western railroad. Two years later he was made assistant manager of the Pittsburgh works of the American Locomotive company; he was made manager the next year. Sensing the future of the motor car, he abandoned railroading to accept a position with the Buick Motor company in 1912, becoming its president and general manager in 1916. In 1919 he was made vice-president in charge of operations of the General Motors corporation, leaving this corporation in 1920 to manage the Willys-Overland company and the Maxwell Motor corporation. While he was engaged with the Maxwell corporation he developed a car of his own and put it on the market. This venture was followed by the organization of the Chrysler corporation, into which were absorbed the Maxwell and Chalmers corporations, and later the Dodge company. Mr. Chrysler served as president until 1935. In the meantime he had built the Chrysler building in New York city, which was the tallest structure in the city at the time. He died at Great Neck, L.I., N.Y., Aug. 18.

Churchill, Winston Leonard Spencer (1874–), British statesman, was born on Nov. 30, the elder son of Lord Randolph Churchill and Jennie, daughter of Leonard Jerome of New York city. For his biography and his political career during the war of 1914–18, see *Encyclopædia Britannica,* vol. 5, pp. 686–7.

Particularly after the union of Austria and Germany in March 1938 did Churchill become an outspoken opponent in parliament of Prime Minister Chamberlain's conciliatory dealings with Germany and Italy. But when the government took a firmer stand with the axis, Churchill pledged Chamberlain his political support. The outbreak of war on Sept. 3, 1939, was the occasion for his re-entry into the cabinet in his old office of first lord of the admiralty. On May 7, 1940, Chamberlain, partly in answer to criticisms of the Norwegian campaign, made him supervisor of day-by-day military operations. Three days later, as the big German drive began and Chamberlain resigned, Churchill became prime minister. The military disasters which followed in rapid succession served to emphasize his qualities of leadership, which had a strong effect in bolstering British morale at one of the gravest moments in the empire's history. On June 4, after the successful evacuation of Dunkirk, he promised that Britain would fight on alone, "whatever the cost may be."

Churchill's public addresses and reports to parliament as the war progressed were in the main simple and frank statements that did not attempt to disguise the gravity of Britain's danger but invariably pointed up the nation's will to resist. Among his more notable pronouncements of 1940 were the following: June 16, he proposed a Franco-British federation which was rejected by the new Pétain government; July 18, he announced the agreement with Japan to close the Burma road (reopened three months later); Oct. 21, in a radio message to the French people, he urged them not to sabotage British war efforts which in the end would bring about France's liberation; Nov. 5, he warned against the growing peril of German submarines to British supply lines and urged the necessity for naval bases in Eire; Nov. 13, he announced Britain's great air raid against the Italian fleet at Taranto; Dec. 12, he reported on the success of the drive against the Italian forces in Egypt, a victory "of the first order"; Dec. 23, he appealed to the Italian people to oust Mussolini.

On Oct. 9 he was elected leader of the Conservative party to succeed Chamberlain (*q.v.*). (*See* also GREAT BRITAIN.)

Church Membership. Church membership showed an increase of 528,631 for 1940, in inclusive membership, as compared with statistics of 1939. The number of churches was 248,780.

This report is based upon the latest figures available, as reported by Dr. Henry Barraclough, secretary of the Association of Statisticians of American Religious Bodies. They cover the period between Jan. and Oct. 1939, and they include churches of over 50,000 members. Further information will be found in the *Year Book of the Churches,* published in 1941 by the Federal Council of Churches of Christ in America.

The "inclusive membership" column in this report gives the official records of the church bodies listed, based on their own reports. The "13 years or over" column is given for use in comparisons and discussions of the relative numerical standing of the churches reported.

The Methodist Church, which became the name of the merged Methodist Episcopal, Methodist Episcopal South, and Methodist Protestant bodies, had no new census report based on the merged body. Hence, they are given here under their former names. The largest Protestant group since their union, they listed 7,544,057 members. (*See* also CHRISTIAN UNITY.)

*Church Membership in the United States in 1939**

Body	*Churches*	*Inclusive Membership*	*13 Years Or Over*
African M. E.	7,115	670,000	590,000
African M. E. Zion	4,205	597,785	520,671
American Baptist Assoc.	2,662	263,484	260,876
American Lutheran Conf.	6,066	1,433,533	1,015,863
Assemblies of God	3,496	184,022	184,022

U. S. Church Membership—Cont.

Body	*Churches*	*Inclusive Membership*	*13 Years or Over*
Brethren (Dunkers)	1,021	173,783	154,073
Christian Reformed	298	121,755	90,271
Christian Scientist	2,169	268,915	268,915
Churches of Christ	6,226	433,714	433,714
Church of God	1,353	83,113	79,452
Church of God in Christ	1,200	200,470	190,470
Colored M. E.	5,258	400,000	300,000
Congregational and Christian	6,096	1,043,276	1,011,978
Cumberland Presbyterian	1,120	71,726	66,452
Disciples	7,981	1,647,654	1,484,337
Evangelical	2,019	230,818	221,359
Evangelical and Reformed	2,863	843,801	658,748
Four Square Gospel	367	257,635	219,050
Free Will Baptist	459	80,000	80,000
Friends (Orthodox)	678	85,257	71,190
Latter Day Saints	1,519	690,401	578,267
Methodist Episcopal	24,195	4,411,597	4,023,376
Methodist Episcopal South	16,959	2,933,080	2,593,373
Methodist Protestant	2,111	198,780	184,667
National Baptist Convention U. S. A.	24,575	3,986,811	3,588,000
Nazarene	2,514	157,962	149,748
Northern Baptist	7,445	1,504,942	1,408,600
Presbyterian, U. S. (South)	3,488	511,364	471,364
Presbyterian, U. S. A.	8,637	1,929,671	1,854,671
Primitive Baptist	2,700	103,125	102,919
Protestant Episcopal	7,325	2,007,504	1,404,779
Reformed Church in America	722	160,805	156,794
Reorganized Latter Day Saints	575	101,122	93,740
Salvation Army	1,646	240,258	104,820
Seventh Day Adventists	2,362	156,205	151,987
Southern Baptist	24,932	4,770,185	4,675,785
Synodical Lutheran Conf.	3,720	1,259,186	897,345
Unitarian	385	57,111	57,111
United Brethren	2,818	419,319	381,580
United Lutheran	3,718	1,587,007	1,174,286
United Presbyterian	861	183,889	176,534
Universalist	530	52,486	51,810
Totals	205,577	36,520,601	32,182,897
Armenian Apostolic	52	108,000	95,950
Greek Orthodox	200	305,000	290,000
Jewish Congregations	4,150	4,081,242	2,930,332
Polish National Catholic	238	526,000	377,142
Roman Catholic	18,757	21,289,307	15,492,016
Serbian Orthodox	36	100,000	75,000
Syrian Antioch Orthodox	71	61,045	61,045
Total	23,710	26,660,214	19,452,323
153 Smaller Religious Bodies	19,493	1,604,711	1,449,594
Totals	248,780	64,785,526	53,084,814

*Continental United States only.

Church of England. During 1940 the church's special efforts to meet the needs of the times were impressive. The archbishops, bishops and clergy were tireless in leadership, and the work of church organizations of all kinds in connection with the migrations of women and children from the danger areas was excellent. The response of the younger clergy at the outbreak of the war to the need for chaplains to the military forces had its sequel in the heroic work of the chaplains in the evacuation of the British expeditionary force from France, when some deliberately chose to become prisoners of war rather than leave the wounded and when a number received awards for gallantry. Such deeds, however, should not be allowed to obscure the courage of thousands of incumbents who remained at their posts, some of them doing so in parishes where whole streets had been reduced to ruin.

The cathedrals and collegiate churches continued their services. A time bomb just missed St. Paul's cathedral and the danger may be estimated from the fact that when removed and exploded on Sept. 15 it caused a crater 100 ft. in diameter. Later, a bomb damaged the high altar. Canterbury, Southwark and Rochester cathedrals were among others which had narrow escapes; and several hundred churches in London and elsewhere were demolished or severely damaged. Building was continued on the new cathedrals of Liverpool, Guildford and Blackburn and on the extension of Portsmouth cathedral.

On June 10 the king opened the new church house, Westminster, probably the most important architectural building completed in 1940, the business headquarters of the Church of England and a centre also for the whole of the Anglican communion. Tributes were paid on that occasion to the initiative and ability of Dr. Frank Partridge, bishop of Portsmouth, the "moving spirit" of the enterprise, and to the genius of the architect, Sir Herbert Baker. During the year the church assembly passed the benefice buildings (postponement of inspections and repayment of loans) measure and the ecclesiastical dilapidations (chancel repairs) measure.

Outstanding changes in personnel included the resignations of Dr. W. G. Whittingham as bishop of St. Edmundsbury and Ipswich, of Dr. M. Linton Smith as bishop of Rochester, and of Dr. C. C. B. Bardsley as bishop of Leicester, and the appointments to these bishoprics respectively of the Ven. R. Brook, archdeacon of Coventry; of the Rev. C. M. Chavasse, master of St. Peter's hall, Oxford; and of the Rt. Rev. G. Vernon Smith, bishop of Willesden.

In the wider world of the Anglican communion special mention must be made of the decision of the Nippon Seikokwai (Japan Holy Catholic Church) to assume complete independence of western aid; of the continuing difficulties of the dioceses in China due to the war; of the very special difficulties of the diocese of Gibraltar and the Anglican chaplaincies in the jurisdiction of northern and central Europe; of the affiliation of the Church of England to the World Council of Churches (in process of formation), which is to carry on officially the work of the oecumenical movement on behalf of the churches; of the serious decline in the incomes of important British missionary societies; and of the generous declaration by Dr. H. St. G. Tucker, presiding bishop of the Protestant Episcopal Church in the United States of America, made on July 11, inviting the American church to contribute to the support of those world-wide missionary activities which looked to the Church of England for financial assistance in the years before the war. (Ro. Sto.)

Church Reunion: *see* Christian Unity; Religion.

Ciano, Galeazzo (1903–), Italian statesman, born March 18 at Leghorn, was the son of Costanzo Ciano, naval hero of the World War of 1914–18. After completing his studies in law at the University of Rome, Galeazzo Ciano entered the diplomatic service and was stationed successively at Rio de Janeiro, Buenos Aires and Shanghai. After his marriage in 1930 to Edda, daughter of Benito Mussolini, his advancement was rapid. In 1934 he was appointed undersecretary of state for propaganda and in the following year minister of the department. In June 1936 he was named foreign minister by Il Duce. The year 1940 held a series of important diplomatic conferences for Ciano and his German counterpart, Ribbentrop (*q.v.*). In June he headed the Italian delegation which signed the Italo-French armistice of June 24.

During the remainder of the year he was present at conferences with Hitler, Goering, Ribbentrop and Laval. On Nov. 20 he signed for Italy the Vienna pact by which Hungary adhered to the axis.

Cigars and Cigarettes: *see* Tobacco.
Cinema Industry: *see* Motion Pictures.
C.I.O.: *see* Congress of Industrial Organizations.
Citrus Fruits: *see* Grapefruit; Lemons and Limes; Oranges.
City Government: *see* Municipal Government.
City Manager Plan: *see* Municipal Government.
Civil Aeronautics Administration: *see* Airports and Flying Fields; Psychology, Applied.

Civil Liberties. The increasing violence of the struggle in Europe, plus the spectacles of disintegration from within, à la Quisling, during 1940 gave rise to increasing antagonisms and pressures for suppression in the U.S. In particular, fears of fifth-column activity, stemming from the stealth and anonymity of communist and nazi forces, gave rise to an indis-

criminate suspicion of all persons and groups who, because of their origins or their ideas, differed from the norm. The most vocal expression of these fears was to be found in the publicity of the Dies committee, which tarred bona fide consumers' groups, liberals and progressives with the same brush as paid agents of foreign governments. The committee is responsible, however, for the passage of a bill calling for fuller disclosure as to foreign agents.

Because of the experience abroad, aliens came to be associated in the public mind with subversive activity, and a federal statute requiring all aliens to register and be fingerprinted was enacted. Fortunately, local state efforts at repression and regulation of aliens proved abortive, but many states denied to the communist party a place on the ballot. This denial of election rights was in 1940 the greatest setback to civil liberties and could have been avoided had the communists not used such tactics as bespoke an active desire to be driven underground.

The LaFollette civil liberties committee continued its courageous disclosures of suppressive groups, particularly among employers, but in 1940 no legislation stemmed from its efforts.

In the field of freedom of conscience the United States supreme court held it to be a proper school legislation to require all those attending public schools to pledge allegiance to the American flag. The cause of racial equality in the school system was given fresh impetus when the test case brought by the National Association for the Advancement of Colored People resulted in a decision that the state of Maryland could not validly pay lower salaries to Negro teachers than to whites in similar positions. Prejudice of a different kind triumphed in New York city when Bertrand Russell was prevented from taking his professorship at the City college on the ground that the ideas he held on such subjects as sex rendered him unfit to teach mathematics and logic.

A victory in the struggle against prudery was won when the federal court of appeals for the District of Columbia held proper for importation a dignified treatise on nudism containing pictures of nude males and females, both singly and together. Partially on the debit side was the decision of the highest court in Connecticut upholding the Connecticut birth control statute which prohibits the use of contraceptives and which was invoked against two doctors and a nurse (who had prescribed contraceptives) on the ground that they were accessories to the crime of using them. The court expressly left open, however, the question whether such prescription might not be legal in cases involving actual "jeopardy of life" from pregnancy. The Massachusetts supreme court whittled away some of its former antibirth control decision when it held that druggists could legally sell prophylactics unless the prosecution could show that the prophylactics were not to be used for the prevention of disease, a virtually impossible assignment.

Books and magazines bearing the imprint of reputable publishers were singularly free from attack during 1940. The continued lack of courage on the part of movie producers, however, meant that various state censorship boards continued to snipe at productions, forcing cuts in some cases and complete withdrawal in others.

In the case of the radio, the code of the National Association of Broadcasters which prohibits the sale of time for the discussion of controversial issues unfortunately meant as a practical matter that less time was devoted to such discussion and, in particular, scant attention was paid to subjects of local interest no matter how vital to the communities served. Nevertheless, the radio, under the administration of the federal communications commission, continued to grow in strength in comparison to the newspapers, which were declining in number. It may be that freedom of the air will overshadow in national importance freedom of the press.

It was feared that the Selective Service act might provoke a host of civil liberties problems. However, the act itself makes provision for conscientious objectors and its wise and tolerant administration has been such that relatively few cases have arisen and those for the most part because the men involved refused not only to serve but also to register. (M. L. E.)

Civil Population, Protection of: *see* CHEMICAL WARFARE.

Civil Service. During the calendar year 1940 the merit system continued to make steady progress, thus closing the decade on a more hopeful note for an improved public service than might have been thought possible in its mid-term. The most significant event was the passage of the Ramspeck bill in the closing days of the 76th congress. This enactment authorized the president to cover into the classified civil service practically all federal positions now exempt, with the exception of positions in the Tennessee Valley authority, the Work Projects administration and positions subject to confirmation by the senate.

The act also authorized the president to extend the provisions of the Classification act of 1923 to the federal service generally (the field service has never been affected), to set up new classifications and scales of pay and to introduce pay differentials for offices at isolated, remote or inaccessible stations or which involve excessive physical hardships or hazards. Finally the Ramspeck act required the establishment in each department of one or more boards of review to hear appeals on efficiency ratings; the chairman of the board is designated by the civil service commission, one member is selected by the head of the department and one elected by the employees. The board and its employee representative both constitute significant innovations. On its broad scope and authorizations, this act deserves to stand as one of the landmarks of civil service reform.

During 1940 state merit councils were organized in all states which lacked civil service commissions for the purpose of holding the examinations required by the 1939 amendments to the Social Security act, and by the end of the year most of the state offices co-operating with the Social Security board had passed under the merit system. The basic requirements of the state systems were specified by the board.

In the Nov. 1940 elections three constitutional amendments requiring or permitting state-wide civil service systems were approved in Michigan, Louisiana and Kansas respectively. The Michigan amendment repaired the damage to the merit system wrought in 1939 by a political overturn, although the form of the amendment was widely criticized; the Louisiana proposal confirmed a new merit system established a few months earlier by legislation and which will be fully effective in 1942; and the Kansas amendment was permissive in nature, although having the important effect of terminating a four-year limit on officeholding. Meanwhile a breakdown in Rhode Island was feared as a result of the 1940 elections in which Governor Vanderbilt, who was chiefly responsible for the inauguration of the merit system in that state, was defeated.

Another important phase of the civil service movement was the enactment by congress in 1940 of the second Hatch act, extending prohibitions against pernicious political activity to all state and local employees paid in part from federal funds, protecting both such employees and relief clients or workers from political assessments and limiting the total expenditures of national party committees.

The provisions of this enactment are sufficiently important both in themselves and in their federal-state context to warrant brief enumeration. The act prohibits any officer or employee of any state or local agency financed in part with federal funds from using their official authority to influence an election or nomination and from requesting any other such officer or employee to make political contributions. They are prohibited from taking any active part in political management or in political campaigns. Certain forms of pernicious political activity are defined and prohibited. The U.S. civil service commission is given power of enforcement, with provision for appeal to the courts.

Despite some loopholes in this measure it revealed the impatience of congress with local political machines fed in considerable part by federal funds and, it must be added, sometimes in the hands of local politicians hostile to incumbent congressmen. The effect upon political participation of public employees in the 1940 election was both noticeable and beneficial. New York state enacted a similar but somewhat weaker measure dealing with state employees.

The civil service assembly issued a revised edition of its census of civil service jurisdictions which revealed the magnitude of the growth of the merit system since 1937. The number of city merit systems increased from 674 to 869; four new state-wide systems were recorded and one was abolished, but all states had introduced merit systems for social security employees. Little progress was recorded in the counties, but the number and proportion of federal civil service employees had increased.

National Defence.—The impact of the defence program was felt in full weight by the U.S. civil service commission. The employment of workers on the defence program was entrusted to the commission by congress. As a result the staff of the commission was more than doubled by the end of 1940 and its appropriations were increased from about $3,000,000 a year to about $8,000,000. The record of accomplishment in timely recruiting of needed employees in arsenals, navy yards, training camps and elsewhere was exceptionally satisfactory. A shortage of personnel technicians and administrators was apparent by the close of the year. The nation's resources in this field were being canvassed in the National Roster of Scientific and Technical Personnel, jointly conducted by the National Resources Planning board and the U.S. civil service commission.

New York.—During 1940 further steps were taken in New York to work out the practical aspects of placing about 150,000 local government employees under the provisions of the merit system. In 1937 the court of appeals held that the constitution of New York required positions in local government to be filled by the merit system. The problem was considered in 1938 by the constitutional convention, which declined to alter the constitutional provisions. In 1939 the legislature established a commission to recommend the necessary steps to cure the defect of a half-century's appointments without examination. An interim report was submitted in 1940 laying down in principle that present employees would not be required to take examinations in order to retain their positions and suggesting alternative methods of future administration. See *Legislative Document 92*, 1940.

Personnel Administration.—Omitting more than passing reference to the consolidation of the council of personnel administration into the U.S. civil service commission (without change of function) and the slow but still perceptible development of joint examinations between different jurisdictions, there may be noted in conclusion the steady development of professional interest and organization in the field of personnel administration. The Washington (D.C.) Society for Personnel Administration strengthened its numbers and position. The civil service assembly began publication of a quarterly, the *Public Personnel Review*, and initiated a study of standards in professional and technical fields in co-operation with the professional group appropriate in each case. The New York city civil service commission started publication of *Public Personnel Quarterly*. Supporting this general trend, the American Society for Public Administration was organized at the close of 1939 and in 1940 issued the first number of *Public Administration Review*, a quarterly in which the broader aspects of personnel administration receive attention. (L. D. W.)

Clairvoyance: *see* PSYCHICAL RESEARCH.

Clarke, Marguerite (1887–1940), U.S. actress, was born in Avondale, Ohio, Feb. 22, and was educated in the Brown County convent. While studying for the stage she took part in amateur performances with success and made her first professional appearance with a stock company in Baltimore in 1899. Her first appearance in New York city was as a child actress with DeWolf Hopper in *Happyland*. She co-starred with him two years later in *Mr. Pickwick* and *Wang*. She appeared in most of the successful musical shows for several years as well as in *Anatol* with John Barrymore and in *Jim the Penman* and *The Prince and the Pauper*. In 1915 she made her first appearance in motion pictures and within two years was one of the most popular screen actresses. In 1918 she married Harry Palmerston Williams of New Orleans; she then retired from the stage and lived on her husband's plantation in Louisiana. On his death in 1936 she took up her residence in New York city, where she died Sept. 25 after a short illness.

Clay. Clay production in the United States totalled 3,928,000 short tons in 1939, an increase of 14% over 1938, but 12% less than in 1937. Imports were 151,400 tons, against exports of 136,500 tons. Refractories of various kinds usually take 45–60% of the supply, ceramics 12–20%, paper 10–13%, filtering and bleaching oils and fats 7–8%, rotary-drilling mud 4–5%, and rubber and linoleum 2–3%. The production of clays of all kinds in Canada is so small as to be negligible, but there is a well-established clay products industry which consumes something like 200,000 tons of imported clays. The clay industry of the United Kingdom is quite extensive, the output of low grade clays and shales amounting to 24,538,000 long tons in 1938; the higher grades included 2,598,000 tons of fireclay, 855,000 tons of china clay and ball clay; all were lower than in 1937. (G. A. Ro.)

Cleveland, a city of northeast Ohio, occupies 73·74 sq.mi. with a population (1940) of 878,336. Cuyahoga county, which includes Cleveland and its major suburbs, has a population (1940) of 1,217,250.

History.—After Mayor Harold H. Burton was elected to the United States senate in the November election he designated Assistant City Law Director Edward Blythin to succeed him. This was accomplished by Burton appointing Blythin law director and then resigning at the end of December.

Under the city charter Blythin then automatically succeeded Burton as mayor.

The passage at a special election March 27 of an amendment to the city charter permitting city council to levy real estate taxes outside the constitutional 10-mill limitation and the passage of 2·1-mill relief levy at the Nov. 5 election contributed toward prevention of relief crises such as the city knew in 1939. In the last quarter of 1940 new acceptances of relief cases were at the lowest point in the history of Cleveland relief. The federal food stamp plan of distributing regular and surplus commodities was put into operation Nov. 1.

Education.—Budget problems continued to plague the Cleveland board of education throughout the year. After voters had defeated a one-mill special levy on May 14, the board on June 23 wiped out an impending operating deficit by cutting the salaries of all employees on a regular schedule. This it did by first raising all employees to 100% of schedule and making all automatic wage increases and then imposing a 30% cut from Sept. 1 to Dec. 31. But when the board sought renewal at the Nov. 5 election of a four-mill, five-year operating levy which provided about one-third of its income, the voters rejected it. The board then reduced the time limit to two years and resubmitted the levy at a special election Dec. 20 at which time it was approved by a majority of nearly two to one.

The Cleveland Health museum, first permanent exhibit of its kind in the United States, was opened Nov. 14 under the direction of Dr. Bruno Gebhard, former director of the health museum at Dresden, Germany.

Finance and Commerce.—Spurred by defence contracts and improved business generally, Cleveland factories expanded, hired more men and added new shifts in 1940. Direct defence contracts awarded to the city's industries during the year amounted to $100,000,000. Still further construction was in sight, for first bids were received Dec. 23 on the $8,400,000 aircraft engine research laboratory which is to be erected on a 200-ac. plot at Cleveland airport. About 300 persons will be employed at the laboratory when it is completed. Other large construction projects under way in 1940 included: $8,200,000 generating station for the Cleveland Electric Illuminating company; $5,500,000 Cuyahoga river straightening project which will open the upper river to the largest lake freighters; $4,600,000 extension of Outhwaite homes, a public housing development; and a $1,000,000 plant for the East Ohio Gas company to liquefy and store natural gas. Up to Dec. 1, 1940, collections in Cleveland's internal revenue district amounted to $34,696,400 as compared with $29,721,400 for the full year in 1939. (P. BY.)

Climate: *see* METEOROLOGY.

Clothing Industry. The clothing industry in 1940 continued recovering from the debacle of 1938. Particularly toward the latter part of the year a vigorous production upswing was noted which would unquestionably carry over to 1941. This was to a great extent due to government military contracts, wherein specifications ensured better garments for soldiers than those made in 1914–18. In civilian clothing the most noteworthy occurrence was the continued rise of sportswear in consumer favour, indicating a desire to stick to comfort and ease in clothing.

New machines appearing on the market included a new belt loop cutting machine, a saddle-stitch machine, a simulated hand-stitch machine, several new fast sewing machines, a very high speed buttonhole machine and special cloth laying equipment, all being timesavers and increasing production.

In the textile field the most outstanding events were the increased use of rayon and cotton—due primarily to the rise of sportswear. Woollens rose in price, due to vast government purchases, and it was debatable as to whether or not a shortage would appear.

The Wool Labeling act, requiring manufacturers to specify fibre content, became a law and there was much discussion as to its merits and the burden it placed on the manufacturers.

The European war did not greatly affect the industry except as pointed out above. Exports rose to a slight extent—almost entirely to countries in the western hemisphere. Interesting is the fact that several large clothing factories were being built in South America—formerly the stronghold of the custom tailor.

There was some wages and hours skirmishing, but generally the industry accepted the wage raises without bickering; some violations were reported and prosecuted by the government. Government activities in size standardization slowed down, due to financial retrenchment.

Up to and including Nov. 30, 1940, with about 56% (based on value) of the clothing industry reporting, total garments cut (including suits of wool, cotton, linen, mohair, trousers and knickers, overcoats, topcoats and separate coats, but not including dress pants, work clothes, shirts, leather garments, pajamas, and very heavy coats) in the men's, young men's and boys' industries totalled 25,208,000 compared with the 1939 figure of 26,064,000. Approximate cuttings in 1940 for all other divisions of clothing were (figures represent 71% of total production based on value), overalls and industrials, 4,850,000 dozen; cotton work pants, slacks, breeches, lined and leather coats, windbreakers, mackinaws, ski suits, hunting coats and miscellaneous sportswear, 7,550,000 dozen; shirts, pajamas and miscellaneous cotton garments, 15,960,000 dozen. Retail sales up to Nov. 30, 1940 were approximately 6% more than 1939, indicating increasing activity for 1941.

British manufacturers in 1940 suffered from government regulation and enemy bombing. They concentrated on uniforms.

(H. Sn.)

Cloves: *see* Spices.

Coal Industry. Of a world total coal production estimated at 1,466,000,000 metric tons in 1938, 75% was concentrated in four countries: Germany 26%, United States 24%, United Kingdom 16% and U.S.S.R. 9%. The comparative status of these major countries is shown in the accompanying graph. The second rank producers, 11 in number, controlled a total of 19%; France and Japan each had 3%, while Manchoukuo, which is under Japanese control, adds 1% to the latter; Poland, Czechoslovakia, Belgium and India, ranging from 2.4% to 1.7%, averaged 2% each, although Czechoslovakia and Poland have disappeared as independent producers and their outputs will be included in that of Germany. South Africa, Netherlands, Canada and Australia each had approximately 1%.

This leaves 4% to be distributed among no less than 34 minor producers.

British empire production is largely in Britain itself; the empire total being 22%, with 16% in Great Britain, nearly 2% in India, about 1% each in South Africa, Canada and Australia, there is only 0.6% remaining for other British territory; half of this is supplied by New Zealand, one-quarter by Southern Rhodesia and the remainder by Malaya, Nigeria, Eire and British Borneo.

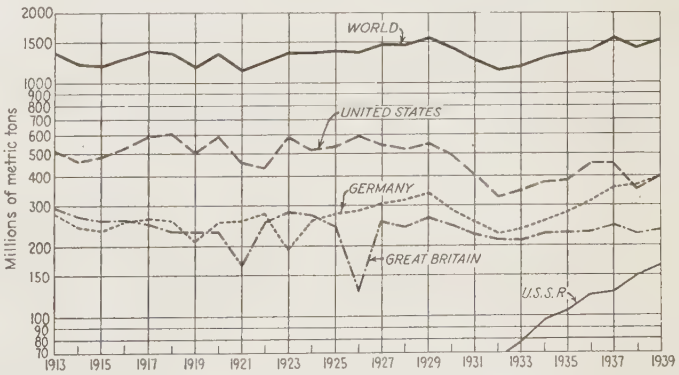
Coal Production of the World

(Millions of metric tons—all grades)

	1929	1932	1937	1938	1939
Canada	15.87	10.65	14.37	12.97	14.08
United States	552.31	326.19	447.58	358.01	403.28
Belgium	26.93	21.42	29.86	29.58	29.85
Czechoslovakia	29.08	26.82	34.67	26.60	?
France	68.49	57.70	45.33	47.56	51.00
Germany	348.61	227.39	372.70	384.92	?
Netherlands	11.74	12.88	14.46	13.66	13.06
Poland	46.31	28.87	36.24	38.11	?
United Kingdom	262.05	212.08	244.27	230.66	236.70
U. S. S. R.	38.42	53.60	127.00	132.89	?
China	?	28.00	?	?	?
India	22.50	20.48	26.09	29.52	?
Japan	36.14	28.22	?	?	?
South Africa	13.02	9.92	15.49	16.28	16.89
Australasia	14.88	13.21	18.03	17.87	19.83
Total	1,559.00	1,124.00	1,540.00	1,466.00	?

United States.—Bituminous production in 1940 was estimated at 453,337,000 short tons, an increase of 15% over 393,065,000 tons in 1939. Anthracite production declined 3%, from 51,487,000 tons in 1939 to an estimated 50,059,000 tons. This gives a grand total of 503,396,000 tons in 1940, an increase of 13.2% over 1939. Industrial consumption of bituminous coal dropped from 33,183,000 tons in Jan. 1940 to 24,988,000 tons in June, with improvement to 37,652,000 tons in November. There were small rises in July and August, increasing in September and October, and declining again in November. The total increase from June to November was divided in the successive months as follows: July 7%, August 10%, September 41%, October 30% and November 13%.

Considering coal as a whole, Pennsylvania is the foremost producing state, but eliminating anthracite and comparing only on a bituminous basis, West Virginia comes first. These two states alone contribute well over half of the bituminous coal output of the United States. Distributed by fields, about 70% of the bituminous output comes from the Appalachian region (Pennsylvania, Ohio, West Virginia, Virginia, eastern Kentucky and Tennessee), 20% from the central region (Indiana, Illinois, Iowa, Missouri and Kansas), 6% from the Rocky mountain and western states and 3% from the southern field (Alabama).



COAL PRODUCTION OF THE WORLD and the major producing countries, as compiled by *The Mineral Industry*

CARLOADS OF GERMAN COAL entering Italy through the Brenner pass in 1940. Britain's blockade forced Mussolini to rely on Germany as almost the sole source of supply

Although there is some international trade in coal, the amounts are relatively so small that the United States is practically self-contained; imports are usually well under 1,000,000 tons and exports have ranged from a high of 24,000,000 tons in 1929 to a low of 10,000,000 tons in 1932, including bunker fuel and the coal equivalent of coke. The 1940 exports were naturally somewhat higher than usual, the total for the year approaching 20,000.000 tons.

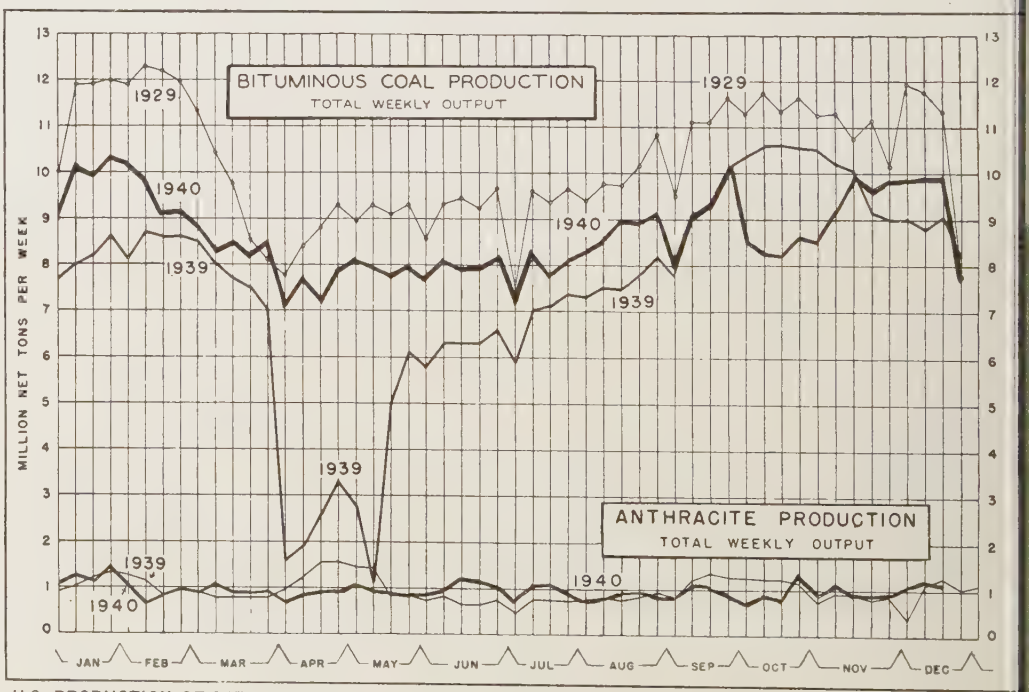
The year 1940 started with the production level at about 10,000,000 short tons of bituminous coal weekly, gradually dropping through February and March to 8,000,000 tons during the second quarter; during the third quarter the 10,000,000 tons level was gradually regained, only to be broken by a heavy sag back to 8,000,000 tons during the first three weeks of October; the former level was regained in mid-November, and held to the end of the year. Aside from the variations mentioned, there were no marked breaks in the production trend except at the usual holiday periods. The first quarter decline was the usual seasonal drop from the winter to the summer rate of production, and the October break was due to the price situation. The government price fixing provisions were scheduled to go into effect the first of October, after having been postponed from the first of September. This having been postponed once, many buyers thought it might be done again, and sought to protect themselves against possible rise in price in the event that prices were not fixed, by making considerable purchases in advance. The prices were fixed at the time set, and this left those who bought in advance with stocks for some weeks to come, with the result that there followed a six weeks' period of slack buying and correspondingly low production. However, on the whole, production conditions were unusually sta-

ble during 1940, the spread between the minimum and ma mum weekly outputs being less than for several years past. T production rate for anthracite was also more stable.

European Production.—Since the beginning of the war Sept. 1939 statistics of production have been suppressed in t major European producing countries, all of which were involv in the war, and in most of the minor countries from the time their occupation by Germany; after some delay this procedu was also followed by the more important producing areas in t British empire, with the result that figures became available o for part of the year 1939. By Jan. 1, 1941, reports for a mater proportion of the 1940 output were available only for Belgiu

Australasia.—The coal output of Australia was 17,184,c long tons in 1939, and of New Zealand 2,342,000 tons.

Belgium.—Having borne the brunt of the German thrust to t west, it might be expected that Belgian industry would be pre well disorganized, but curiously enough, this does not seem have been the case. Production in 1939 was little affected the outbreak of the war, the monthly average output during t last quarter being practically the same as that for the ye



U.S. PRODUCTION OF BITUMINOUS AND ANTHRACITE COAL. Source: Bituminous Coal Division, U.S. Department the Interior.

and the year's total was 29,846,000 metric tons, only 1% over that for 1938. But for the outstanding application of the slogan "business as usual" one must turn to the period immediately following the invasion of Belgium, early in May. It is true that instead of the usual monthly reports of output, the May and June reports were consolidated into a single total, but this total was 3,870,000 tons, against 2,832,000 tons in April, a drop of only 26%. In June the monthly reports were again back on schedule, though output had dropped to 684,000 tons, and each succeeding month showed marked improvement, until for September, the last to be received (Jan. 1, 1941), the output had climbed to 2,229,000 tons, 15% below the April figure. The total for the nine months was 18,429,000 tons, or at the rate of 24,600,000 tons for the year, 15% less than for 1939.

Canada.—From preliminary figures for 1940 an output of 17,420,000 tons is estimated for the year, a 10% increase over 1939. Imports increased heavily in the second and third quarters, but declined in the fourth; the total for the year will exceed 18,000,000 tons, up one-third from 1939.

India.—Production in 1938 rose by 13% to 28,343,000 tons; no total is available for 1939, but such data as were at hand (Jan. 1, 1941) indicated little change from 1938, and in the first half of 1940 the production rate rose about 5%.

Netherlands.—Production dropped 5% in 1939, to 12,681,000 metric tons. Imports during the year, including the coal equivalent of coke and briquettes, were about 7,000,000 tons and exports about 6,500,000 tons.

South Africa.—Production in 1939 increased 5% over 1938, to 21,524,000 short tons, and to 9,176,000 tons in the first half of 1940. Sales in the first three quarters of 1940 were 14,125,000 tons, or at the rate of 18,800,000 tons for the year. (*See* also FUEL BRIQUETTES.) (G. A. Ro.)

Coast Guard, U.S.

On Aug. 4, 1940, the coast guard celebrated its 150th anniversary. Its antecedent, the U.S. revenue cutter service, was organized after the American revolution by an act of congress approved by President Washington Aug. 4, 1790. The sesquicentennial year was marked by an addition of national defence duties to the usual peacetime activities of enforcing all federal laws on navigable and territorial waters and safeguarding the security of vessels in U.S. waters. During the year the personnel was increased by national defence appropriations to provide for an average enlisted force of about 15,000 men for the fiscal year 1940–41. Of the $10,700,000 appropriated by congress for defence activities of the coast guard, approximately $8,200,000 was scheduled to pay for emergency conversion of coast guard vessels for naval use. This work included revision of armament, installation of guns, enlargement of magazines and other structural changes on the cutters and patrol boats.

A major activity of the coast guard during 1940 was its neutrality patrol, established in 1939 to prevent any belligerent from using U.S. ports for unneutral acts. Because of the almost total lack of meteorological data normally supplied to the U.S. weather bureau by ships of all nationalities at sea, the coast guard set up an Atlantic weather patrol in Feb. 1940. Two cutters were equipped as floating weather bureaus and stationed between the Azores and Bermuda to collect and transmit data. By presidential proclamation of June 27, 1940, the coast guard was charged with supervision of the anchorage and movement of vessels and the loading and unloading of vessels with explosives and other dangerous cargoes.

In the fiscal year 1939–40 the coast guard rescued 9,249 persons in peril, assisted 32,084 persons aboard vessels, cared for 410 persons in distress, assisted vessels and cargoes valued at $88,016,268, boarded and examined papers of 39,450 vessels and seized 21 vessels.

A total of 1,581 aids to navigation, principally daymarks, buoys and minor lights, were established during the year and 767 aids were discontinued, leaving a net increase of 814 and a net total of 30,420. Relief forces were dispatched to aid sufferers from the Susquehanna river flood in April 1940, and considerable planning was undertaken for coast guard activities in future floods.

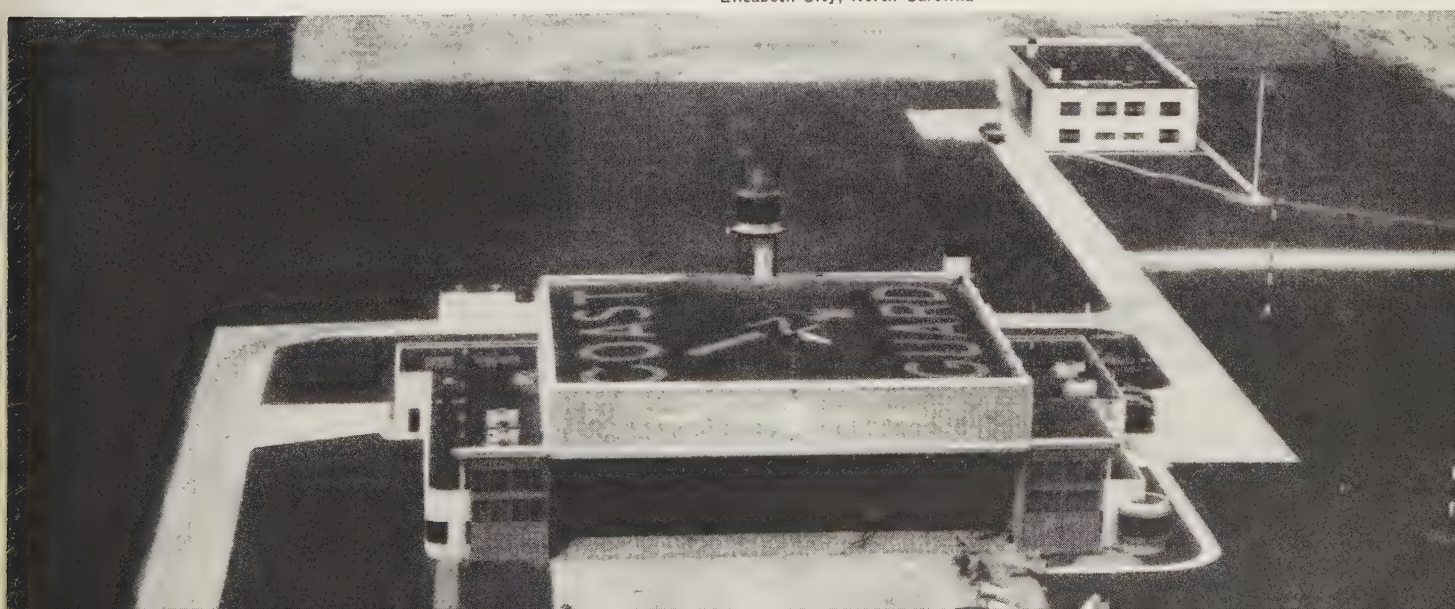
At the end of its first year on Oct. 5, 1940, the newly-established coast guard reserve numbered more than 3,000 men. This organization was created by congress to educate yachtsmen and other small boat operators in the proper handling of their craft. (R. R. W.)

Coast Guard Academy, U.S.

The largest entering class in the U.S. Coast Guard academy's history—147 cadets—began its training at the academy in 1940. This class represented the top contestants among the 1,763 who took the nationwide competitive examinations for admission to the academy.

The congressional board of visitors, after its annual inspection of the academy May 3, 1940, recommended the appropriation of an additional $1,000,000 for expansion of the educational program made necessary by increased enrolment of the cadet corps.

NEWEST AIR STATION of the U.S. Coast Guard, dedicated Oct. 17, 1940 at Elizabeth City, North Carolina



In its report the board commented on the high educational standards of the institution.

As a result of the Engineering Council for Professional Development's inspection of the Coast Guard academy in 1940, the academy was certified and classed among the upper 10% of technical colleges in the United States.

During the year the academy was also approved by the Association of American Universities as an institution having the right to grant the degree of bachelor of science. This approval places a graduate of the Coast Guard academy on the same footing as the graduate of an accredited civilian university.

The annual practice cruise of the first and third classes took place during the summer aboard the cutters "Saranac" and "Sebago." During this cruise the cadets visited the west coast and several ports of Spanish America.

Total enrolment at the beginning of the fall semester in 1940 was 287, of which 24 were in the first class, 36 in the second class, 84 in the third class and 143 in the beginning class. Four of the original 147 in the beginning class dropped out before the start of the term. (R. R. W.)

Coaxial Cables: *see* TELEPHONE: *Coaxial Cable.*

Cobalt. World production of cobalt was estimated at 4,800 short tons in 1939, including approximately 1,700 tons from Northern Rhodesia, 1,400 tons from the Belgian Congo, 800 tons from French Morocco, 366 tons from Canada (for many years the leading producer), and 250 tons from Burma. The chief metal use is in the so-called stellite alloys, combinations of cobalt and chromium, with sometimes other metals added, and in special alloy steels, mainly for permanent magnets. The most used compound is the oxide, which has long been a standard blue colouring agent in the glass and ceramic industries, while smaller amounts of other compounds are used as driers in paint and varnish. (G. A. Ro.)

Cochin-China: *see* FRENCH COLONIAL EMPIRE.

Cocoa (CACAO). As a "comparatively unessential" commodity cocoa in world trade was severely restricted in 1940 by governmental regulations, shortage of shipping and the British blockade. As of Sept. 1, 1940, the British government took control of cocoa in the United Kingdom and rationed supplies to manufacturers on an annual basis of 100,000 tons, about 20% under current consumption. Early in the year the British government announced it had bought the 1939–40 Gold Coast main crop of cocoa at approximately £16 per ton to protect growers in British West African mandates. During the war of 1914–18 cocoa sold as low as £4 per ton. The main 1939–40 crop in the Gold Coast and Togoland was estimated at 235,000 long tons. Later, in May, the government announced it would buy the light intermediate crop in Nigeria, estimated at 10,000 tons, at £10 per ton for destruction. Before the European war Germany consumed about 15% of world production of cocoa. With Germany and other European countries out of the market, growers throughout the world faced disaster. In Brazil, exports the first seven months of 1940 were 459,128 bags of 60kg. each, compared to 840,096 bags in the same period in 1939. In an effort to relieve growers the Brazilian government took charge of exports. The 1939–40 main crop in Brazil was estimated at 1,900,326 bags. The Dominican Republic's main crop was 21,000 metric tons. Exports from Ecuador the first seven months of 1940 were 6,389,238kg. (11,531,353kg. in the same period in 1939). (S. O. R.)

Coco-Nuts. Of all agricultural products that enter into international trade, coco-nuts were among those most adversely affected in 1940 by the European war. So large w surplus stocks of coco-nut products in the Philippine islands t copra prices in August sank to an all-time low and copra cake being used for fuel, with an over-supply even for that form consumption. Normally copra cake and meal are exported fr coco-nut growing countries to be used as cattle feed. In 1 many countries found their markets for coco-nut oil, copra a cake in Europe almost completely cut off. The market for oil a copra in the United States was also severely affected by an abu ance of lard, cotton-seed oil, soybean oil and other vegetable that compete with coco-nut oil in the manufacture of oleom garine and cooking fats. Lard exports from the United States a were a substantial competitor against coco-nut oil in Latin Am ica. Heavy increases in ocean freight rates also curtailed coco-n products shipments. In May 1940, rates from the Philippines U.S. Pacific coast points were increased from $9.50 to $13.50 p ton for copra, from $8 to $11.50 per ton for copra meal, and fr $15.50 to $20 per ton for oil. Manufacturers of desiccated co nut continued to operate at capacity in the Philippines owing the cheapness of coco-nuts, but the market for desiccated co nut in the United States was thereby threatened with an ov supply. World production of coco-nuts, in terms of copra, is a proximately 7,333,000,000lb. a year. Of this the Netherlan Indies produces about 25%, the Philippines 22%, British In 18%, Ceylon 9%, Malaya 8%. (S. O. R.)

Coffee. A new use for coffee, as raw material for the manuf ture of plastics, was initiated in 1940 when the B zilian government bought the patents for a newly-developed pr ess of plastics manufacture and began in August the erection o plant to convert green coffee beans into plastics for use in radi automobiles, telephones, etc.

The new plant is at São Paulo, Brazil, and is designed to 37,000 bags (133lb. to the bag) of coffee a year. If the enterpr is successful the plant will be expanded. The new plastic is cal "cafelite."

The Brazilian government annually spends millions of doll to take surplus coffee off the market and destroy it. From 1 up to Feb. 29, 1940, it had bought and destroyed 9,100,000,000 of coffee.

World production of coffee in the crop year ending in 1940 v reported by the International Institute of Agriculture, Rome,

Table 1.—*Production in Principal Coffee Countries for 1939-40*

American producers	1939–40 lb.	1938–39 lb.	Five-year average
Brazil	*2,755,787,000	2,923,339,000	3,302,977,000
Colombia	588,636,000	548,227,000	538,591,000
Venezuela	143,301,000	85,981,000	132,322,000
Guatemala	121,255,000	119,050,000	113,671,000
El Salvador	119,050,000	145,506,000	132,939,000
Mexico	110,231,000	85,981,000	94,975,000
Cuba	70,548,000	67,682,000	72,092,000
Haiti	**55,116,000	64,596,000	61,289,000
Costa Rica	**52,911,000	44,534,000	51,192,000
Dominican Republic	46,297,000	47,400,000	51,588,000
Nicaragua	**26,456,000	27,337,000	33,995,000
Puerto Rico	*19,842,000	18,960,000	14,815,000
All American total	4,109,430,000	4,178,593,000	4,600,446,000
Non-American producers	**1939–40 lb.**	**1938–39 lb.**	**Five-year average**
Dutch East Indies:			
European plantations	125,884,000	100,531,000	127,472,000
Native plantations	*110,231,000	136,026,000	131,484,000
Madagascar	66,139,000	65,037,000	44,754,000
Belgian Congo	50,706,000	47,840,000	33,202,000
Angola	41,888,000	38,801,000	36,322,000
Tanganyika	**37,920,000	30,644,000	32,144,000
Kenya	36,376,000	39,683,000	38,272,000
India	*33,069,000	35,274,000	36,024,000
Ethiopia	*33,069,000	33,069,000	37,876,000
Non-American total	535,282,000	526,905,000	517,550,000
Grand total	4,644,712,000	4,705,498,000	5,117,996,000

*Unofficial estimate. **Exports.

4,841,367,000lb., compared with 4,931,757,000lb. in 1939, and an annual average of 5,274,357,000 lb. for the years 1936–40.

Table II.—*Production of Coffee by Principal Areas and Percentage for 1939-40*

	1939–40 lb.	Per cent of world production	1938–39 lb.	Five-year average
South America	3,551,658,000	74.0%	3,657,481,000	4,045,937,000
Central and North America	634,933,000	13.1%	634,933,000	641,106,000
Africa	348,332,000	7.2%	335,104,000	260,587,000
Asia	293,216,000	6.0%	291,011,000	313,499,000
Oceania	13,228,000	0.3%	13,228,000	13,228,000

Production in the principal coffee countries in 1939–40 and 1938–39 and the average for 1936–40 were reported as in Table I by the International Institute of Agriculture.

Table I omits smaller producers such as Peru, Bolivia, Netherlands Guiana, Trinidad, Tobago and others and therefore the grand total is less than that of Table II. Brazilian 1940 production was officially estimated at 2,892,000,000 lb. which the International Institute of Agriculture considered too high because of unfavourable drying weather and, therefore, gave a smaller estimate of 2,755,000,000 lb. The Brazilian carry-over was 93,000,000 lb. Brazil in 1940 extended the prohibition against new coffee planting to June 30, 1941. The government also provided extraordinary war-risk insurance, indemnities to be paid in coffee where loss was from torpedoing or confiscation. Larger American producing countries continued or adopted government support for coffee growers in 1940, including provision for a coffee planters' bank in Cuba. The Mexican government is endeavouring to extend coffee cultivation. Coffee was rationed in 1940 in Italy and Sweden and in Germany a considerable coffee substitute industry was built up. Canada placed a war tariff on coffee imports. (*See* also BRAZIL; GUATEMALA.) (S. O. R.)

Coinage. The United States mint service is an adjunct of the treasury department. It consisted in 1940 of eight field institutions in widely scattered localities, administered by the director of the mint, from the bureau of the mint in Washington. The eight institutions were three coinage mints, in Philadelphia, Pa., Denver, Colo., and San Francisco, Calif.; assay offices in New York, Seattle, Wash., and New Orleans, La.; a bullion depository for storage of gold, at Fort Knox, Ky., and a bullion depository for storage of silver, at West Point, N.Y.

Coinage.—Coinage manufactured by the U.S. mints for the United States during the calendar year 1940 was the largest in the history of the mint, amounting to 1,209,478,982 pieces, valued at $50,157,850.32.

Half dollars	13,717,279 pieces
Quarter dollars	46,756,846 pieces
Dimes	108,119,827 pieces
Nickels	259,729,158 pieces
Cents	781,155,872 pieces

The nickel was the Jefferson design, adopted in 1938; it superseded the buffalo nickel, which, however, continued in circulation.

All mint records for monthly coinage in the United States were broken in Dec. 1940, when 199,453,615 pieces were struck, the largest production in any one month since the founding of the mint in 1792. September production was the second largest in mint history, reaching 171,067,068 pieces.

Coinage executed for foreign governments amounted to 33,170,000 pieces. The U.S. mints in 1940 executed coins for El Salvador, Indo-China, Nicaragua and Panama.

Gold and Silver Acquisitions.—Gold acquisitions by the mints and assay offices of the United States, during the calendar year 1940, amounted to approximately $4,351,000,000. Silver acquisitions of the mints and assay offices of the United States in 1940 amounted to 212,400,000 ounces (approximate).

(N. T. R.)

Coke. The production of coke centres in the more heavily industrialized countries, particularly those with a large pig iron output. World production, including both oven coke and gas-house coke, decreased about 14% in 1938, to an estimated 165,000,000 metric tons, the approximate distribution being: United States 19%; Germany 31%; United Kingdom 16%; U.S.S.R. 12%; France 6%; Belgium 3%; Japanese empire 2%; Netherlands 2%; India, Canada, Poland, and Italy 4%. Figures are incomplete for 1939, but there was an increase in the larger producers, except Russia.

The United States produced 44,327,000 short tons of oven coke in 1939, of which 97% was by-product and 3% beehive, and an additional 3,406,000 tons of breeze; this is an increase of 36% from 1938. Of the total consumption, 70% was used in the production of pig iron and ferro-alloys. Production recovered still further in 1940, the output for the first 11 months being 31% above that for the corresponding period in 1939; this should give a total for the year that just about equals or possibly slightly exceeds the former record high of 56,478,000 tons, made in 1918. Foreign trade plays very little part in the industry, exports and imports each being of the order of 1% of the output. Coke production took 16% of the bituminous coal production of the United States in 1939, aside from that used in gas works.

Germany is normally the second largest producer of coke, but the reduced output in the United States in 1938 left Germany in the lead; in 1938 oven coke increased 6% to 43,511,000 metric tons; in addition, gas works coke is approximately 5,000,000 tons, and brown-coal coke 2,000,000 tons. Germany is a heavy exporter of coke, but net exports in 1938 took only 12% of the output, as against 20% in 1937.

Data for 1939 include only through July, with output 4% above the 1938 average.

Coke production decreased 7% in the United Kingdom in 1938, to 26,699,000 long tons, including 12,843,000 tons of gas-house coke, 12,645,000 tons of by-product, 180,912 tons of beehive, and 1,030,000 tons of breeze. Coke production consumed 17% of the bituminous coal output in 1938. Coke exports were 1,991,000 tons. (G. A. Ro.)

Cold, Common. New studies were reported in 1940 on constitutional factors which predispose to the common cold. These included abnormal vasomotor reactions, *i.e.* control of the blood vessels, examples of which are blushing and pallor, minor disorders of the endocrine system and of the acid base metabolism. At least one group of observations on school children supported the theory that a variety of microorganisms may act as the inciting agent in the production of common colds.

Reports during 1940 on the value of vaccines continued to give mixed results. Dochez, using a cultivated filtrable virus, produced immunity in animals for a period of 18 months but failed to produce any immunity in human beings. Others using the virus produced immunity to artificially produced but not to natural colds. Stafford immunized a group of students with a bacterial vaccine so that the number of severe colds and total days of illness were only one-fifth of that suffered by a group not vaccinated.

On the other hand Diehl and his associates produced no worth-while immunity with a variety of bacterial vaccines.

Neoprontosil (of the sulphanilamide family) nasal sprays have been recommended to reduce congestion in acute stages of head colds. Avoidance of pneumonia may be accomplished, it is suggested, by administering small doses of sulphapyridine thereby reducing the number of pneumococci in the nose and throat of the cold sufferer.

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College Baseball: *see* BASEBALL: *College Baseball.*
Colleges and Universities: *see* UNIVERSITIES AND COLLEGES.

Collins, Edward Day (1869–1940), twice acting president of Middlebury college, was born at Hardwick, Vt., Dec. 17. He was graduated in 1896 from Yale, which gave him his Ph.D. three years later. After teaching history at Yale for two years he entered business, resuming teaching in 1909 when he became professor of pedagogy at Middlebury, serving successively as acting president, provost and controller. He retired from college work in 1923 and devoted himself to the development of École Champlain, a French camp for girls. He died at Middlebury, Jan. 1.

Colombia, a republic in northern South America bordering both the Caribbean and the Pacific; language, Spanish; capital, Bogotá; president, Dr. Eduardo Santos; area, 448,794 sq.mi. The population was 8,724,839 according to the census of 1938. The principal cities are: Bogotá, 331,400; Medellín, 170,622; Barranquilla, 152,348; Cali, 110,579; Cartagena, 86,197; Manizales, 83,346; Ibague, 61,860; Cucuta, 57,251; Bucaramanga, 49,891; Pasto, 49,533; Neiva, 34,699; Santa Marta, 33,163; Popayán, 24,479; Tunja, 20,417. Population is very largely concentrated on the eastern Andean plateau, the interior departments of Antioquia and Caldas, and the upper Cauca valley.

History.—The year 1940 was marked in Colombia by sharp and frequently acrimonious disagreements and splits within the ranks of the Liberal party and, to a lesser degree, in the Conservative (opposition) party, with the differences arising from disagreements on internal as well as external policies of government. The chief source of friction was the prospective candidacy of former president López, representing the more leftish wing of the Liberal party, in the presidential election of 1942. President Santos, a moderate Liberal, held relatively aloof, but a majority of the Liberal members of congress went on record as favouring López. In September, however, a temporary Conservative and moderate Liberal coalition in the lower house of congress gained control of the house's organization. A few weeks later, Laureano Gómez, leader of the Conservative party, declared López' return to the presidency would invite civil war. Gómez likewise was strongly critical of President Santos, whom he bitterly attacked for his strong support of western hemisphere solidarity and friendship with the United States. In so doing Gómez tended to link himself and the Conservative party with pro-nazi and fifth-column elements, whose activities were strongly opposed by the government. For this he was strongly criticized by important sections of his own party. In May and June, especially, national attention was focused on fifth-column activity. Charges were freely made that former personnel of the German-owned SCADTA airline, whose services were taken over by the Pan American airways, and German commercial agents in the country were plotting eventual political domination of the country. Anonymous handbills were circulated declaring that, upon German victory in Europe, Panama would be restored to Colombia. Upon Italy's formal entry into the European war, serious anti-Italian rioting occurred in Bogotá. In June President Santos defended his support of Pan-Americanism, declaring it a policy "based on the realities and needs of the continent." In other respects Colombia acted in close accord with the United States, supporting that country at the Havana conference.

In June the government announced a far-reaching econor and financial program creating facilities for medium and lo term credits to farmers and cattlemen, and giving state aid agriculture, cattle raising and manufacturing, and accelerat construction of railways, highways and other public works. Li wise, efforts were made to shift the country away from sing crop economy. To this last end, in conjunction with the Int American Coffee Quota agreement, a system of price and exp control of coffee was inaugurated in November. Introduction new crops, as rubber and quinine, were encouraged through g ernment financial aid.

Education.—In 1938 there were 9,208 primary schools (enr ment 627,730), largely supported by the national and local g ernments; 401 secondary schools (enrolment 33,730), over 75 of them privately controlled, but with government financial sistance and determination of standards; and 21 normal schoo with 2,633 students. Numerous commercial, night, art and oth schools made a grand total of 10,483 schools (enrolment 717,05 Between 1934 and 1938 primary school enrolment increased 14·6%, secondary and normal school enrolment by nearly 16 The National university at Bogotá and the University of Med lín are the most important of the country's several universiti

Finances.—The monetary unit is the peso (value: 58 ce U.S.). During 1940 Colombia received a $10,000,000 loan fr the United States Export and Import bank. In December, af a temporary resumption of payments on defaulted bonds, a p manent arrangement was effected, under which, beginning Feb. 15, 1941, annual payments would be made which wo amortize $45,000,000 of bonds over a 20-year period. The dol debt of the republic aggregates an approximate $54,000,000, b departmental and other bonded indebtedness guaranteed by t central government bring the total to an approximate $150,00 000, not including heavy accrued interest. A sterling indebtedn of £2,666,290 is in similar default.

Trade and Communication.—Colombia's external mariti communication is mainly through Cartagena, Barranquilla a Santa Marta on the Caribbean, and Buenaventura and Tum on the Pacific. Highways connect the country with Ecuador a Venezuela. Air transport looms large in the country's intern tional communications, as well as in internal, owing to the inad quacy of land routes from the coast to the interior plate where the great bulk of the population is centred. In 1938 ra roads in operation totalled 3,282 km. The national highw system included 7,507 km. in operation, 2,796 km. under co struction, and 4,648 km. projected. Departmental highway s tems included 4,844 km. in operation and brought the gra total to 12,340 km. in operation, 4,874 km. projected. Th short aerial cableways for freight and passenger transportati measure 88 miles. The Magdalena river is still an importa commercial artery, despite difficulties of navigation during t dry season.

In 1939, imports (largely textiles and other manufactur goods) totalled 183,462,000 pesos (15·2% over 1938), with t United States leading (54·0%), followed by Germany (12·8 and Great Britain (9·5%). Exports, including 40,582,000 pe in gold bars, were 177,054,000 pesos, an 8·5% increase, with t United States taking 66·9%, followed by Curaçao, Germany a Canada. In 1939 coffee comprised 49·2% of all exports, petrole 18% and bananas 4·9%. In the first half of 1940, with a sha decline in coffee shipments, exports declined nearly 15%. Pet leum export, however, increased.

Agriculture and Mineral Production.—In addition to t principal agricultural exports, Colombia produces sugar, whe rice, cotton, cacao and tobacco, largely for domestic consumptic Mineral resources are extensive. Colombia is ninth in world pet

leum production (1939: 23,774,150bbl.; 1940 est.: 26,864,400 bbl.); second in platinum and first in emeralds, while gold is also extensively mined. The coffee industry is the main basis of the national economy, however, as it is Colombian-owned, while the petroleum, banana and platinum industries are largely foreign-owned.

Under the Inter-American Coffee Quota agreement of Nov. 1940, Colombia is allotted 3,150,000 bags (of 60 kg. each) for export to the United States, 5% less than actual export in 1938. Manufacturing for domestic consumption is on the increase. In June 1940 the Industrial Development institute was established to encourage domestic manufacturing and stimulate development of mineral resources, with power to grant certain tax exemptions and other financial aids. (L. W. Be.)

Colorado, a Rocky mountain state of the United States, popularly known as the "Centennial state," admitted to the Union in 1876; area 103,658 sq.mi., one-third occupied by mountains; highest mean elevation of all states in the Union, 6,800 feet. Population (1940) 1,123,296; urban population slightly larger than rural; whites 90% of total, Mexicans 5%, remainder Indians, Negro and scattered. Capital and largest city, Denver, 322,412.

History.—State officers were in 1940: Ralph L. Carr (R.), governor; John C. Vivian (R.), lieutenant governor; Walter F. Morrison (R.), secretary of state; Charles M. Armstrong (R.), state auditor; Homer F. Bedford (D.), state treasurer; Gail L. Ireland (R.), attorney-general; Mrs. Inez Johnson Lewis (D.), state superintendent of public instruction. In the 33rd General Assembly, convened Jan. 1, 1941, the senate was Democratic and the house Republican. In the 1940 presidential election the returns for Colorado show 278,855 votes for Mr. Willkie and 265,364 for Mr. Roosevelt. Principal legislative measures with political significance: reorganization of state government and continued diversion of income taxes from school funds to state general fund to offset demands of public assistance program.

Public Assistance.—In Jan. 1940, 53,647 households were receiving assistance (pensions, dependent children's aid, aid to the blind, tuberculosis hospitalization and direct relief), the cost of these activities in 1939 having been $19,259,429, including $6,528,296 in federal grants. The number receiving old-age pensions increased from 37,960 in Jan. 1939 to 40,168 in Jan. 1940. Although the pension amendment, twice upheld by popular vote, provides for $45 a month, average 1939 payment was $29.55, due to insufficient income. Colorado's pension payments are second highest in the United States.

Water Development.—In addition to projects costing more than $2,000,000 completed in 1939 for storage of irrigation water, projects totalling more than $60,000,000 in cost were under construction in 1940 for transmountain diversion, flood control and storage. The largest are the Colorado river diversion through the mountains to the South Platte valley and the combined irrigation storage and flood control project on the lower Arkansas river, near the Kansas line.

Highways.—Following completion of the $25,000,000 highway construction program in 1939, funds for road construction were curtailed by the demands of debt service. Including federal aid, construction in 1939 totalled $9,009,000 and in 1940, $8,540,500. Construction of the primary highway system is now considered about 85% complete.

Public Buildings.—The program of new construction at 21 state institutions continued through 1940 under the terms of a 10-year financing plan established in 1937. Some revision of original allotments was made for the last five years of the period to meet changing conditions.

Agriculture, Manufactures, Mineral Production.—Farm products, $134,265,000; manufactures, $237,838,000; tourist business, $73,000,000; all minerals, $60,403,000; 145 banks with total assets of $379,735,800. (E. D. F.)

Colour Photography: *see* Motion Pictures; Photography: *Colour Photography.*

Columbia, District of: *see* Washington, D.C.

Columbia University, in New York city, had in 1940–41 a registration of 31,411 resident students, including the summer session of 1939; there were 10,568 students in the summer session in 1940. The total number of officers of administration and instruction was 3,317. There were 70 university buildings on Morningside Heights. In 1940 the university capital endowment was $87,995,257.73 and the total resources were $155,071,205.43.

The budget appropriation for 1939–40 was $14,929,915.69. Tuition fees range from $400 to $553. Its library numbered 1,710,062 volumes. A new building, Brander Matthews hall, erected on 117th street, provides for the theatre arts work of the university. Earl hall, formerly used in large part for dramatic work, has been restored to its original purpose, a centre of the religious life of the university. New educational experiments were begun at Bard college at Annandale-on-Hudson. The Columbiana collection, the university archives, was transferred to new and enlarged quarters in the Low Memorial library.

Celebrations were held upon the 50th anniversary of the founding of Barnard college and upon the 75th anniversary of the school of mines. (M. H. T.)

Columbium. Columbite recovered by retreatment of tailing piles at tin mines in Nigeria is the world's chief source of columbium, but it is also found associated with tantalum in ores from the Belgian Congo, Australia, Uganda, South-West Africa and Brazil.

Shipments from Nigeria were discontinued after the outbreak of war in Europe, exports for 1939 amounting to 231 long tons, against an output of 431 tons. The metal is sold mostly as a ferro-alloy containing 50–55% Cb, for use as an addition agent to stainless steels for the reduction of intergranular corrosion, and was quoted throughout 1940 at $2.25–$2.35 per pound of contained columbium. Pure metal was quoted at $560 per kilo for rod, and $500 for sheet. (G. A. Ro.)

Commerce: *see* International Trade; Trade Agreements.

Committee for Industrial Organization: *see* Congress of Industrial Organizations.

Commodity Prices: *see* Agriculture; Prices.

Commons, Members of House of: *see* Parliament, Houses of.

Commonwealth Fund, The. This endowment, established in 1918 by Mrs. Stephen V. Harkness "to do something for the welfare of mankind," and later increased by gifts from the founder and from Edward S. Harkness, president of the fund from its inception until his death on Jan. 29, 1940, amounted in 1940 to approximately $49,000,000. In 1940 the fund appropriated some $2,000,000. Of this total more than two-thirds was devoted to the promotion and maintenance of physical health. Appropriations for needs arising out of the war amounted to $135,000.

Public health activities, designed to raise standards of rural service, centred in Tennessee, Mississippi, Oklahoma and Alabama. The 12th in a group of rural community hospitals built

or remodelled with aid from the fund was opened in 1940; two more were under way. Some $450,000 was given for medical research. The Commonwealth fund fellowships for British graduate students at American universities were curtailed but not suspended. The fund continued to aid child guidance enterprises in England; maintained an advisory service for community mental hygiene clinics in the United States; supported studies in administrative law and legal history; and published in 1940 11 books and pamphlets of educational significance in its fields of operation. The directors of the fund were in 1940 Malcolm P. Aldrich, president; Robert A. Lovett, vice-president and treasurer; Phil W. Bunnell, Samuel H. Fisher, George Welwood Murray, Dean Sage and William E. Stevenson.

Communism, or revolutionary Marxism, is a system of government evolved under the leadership of Lenin and Stalin in the soviet union. Communism believes in the dictatorship of the proletariat for a transitional period, after which a free society would come into existence in which everybody would contribute to the common weal according to his capacities, and receive a reward according to his need. This ultimate goal seemed in 1940 still very far away in the soviet union; meanwhile the soviet union represented a dictatorship of the Communist party with state ownership of all the important means of production. Communism proclaims the equality of all peoples and races and believes in the final establishment of a peaceful international order. Within this general frame communist policy has undergone several fundamental and sometimes sudden changes since 1920. The last of these so far occurred in Aug. 1939, when the soviet union, and with it all the communist parties throughout the world, abandoned the pretence of collaboration with the democratic nations and struggle against fascism, and lined up side by side with aggressive fascism which they had proclaimed until then as the mortal enemy of the proletariat, of peace and of progress. Since then, and during 1940, the Communist party everywhere has played a rather enigmatic and ambiguous role; nevertheless it has directed all its main attacks against democracy, against Great Britain's effort to resist fascist aggression, and against the defence program of other democracies, including the United States, to prepare themselves against similar fascist aggression. At the same time, the spirit of co-operation between fascist Germany and the communist soviet union was emphasized repeatedly. Even the conclusion, on Sept. 27, 1940, of a formal alliance of the three great fascist powers, Germany, Japan and Italy, which fundamentally represented the revival of the old anti-Comintern pact, did not lead to any estrangement between national socialist Germany and communism, although the hopes for closer co-operation between the soviet union and fascist Japan were not in 1940 realized. A visit by the prime minister and foreign secretary of the soviet union, Mr. Molotov, to Chancellor Hitler in Berlin on Nov. 12, 1940, did not bring any new elucidation of the communist stand, and the subjects and results of their talks remained unknown.

Several changes in the high command of the Communist party were indicative of changes in policy. Vice-Commissar of Foreign Affairs Vladimir P. Potemkin, who had been the collaborator of Maxim Litvinov, was transferred on Feb. 29 from his post to the minor one of commissar of education of the Russian Socialist Federated Soviet Republic. On May 8 Marshal Klementiy E. Voroshilov, who had been people's commissar of defence for 15 years, was named vice-premier, and Marshal Semyon Timoshenko took his place. The next day the soviet army ended the divided commands under which political commissars had wielded wide power, and fuller authority was given to the military officers. The generals and admirals of the red army and of the red navy were re-instituted to full military authority and responsibilit The soviet press hailed this return to the old order and assailed i own former standpoint as "ossified dogmas." The measure w intended to strengthen the discipline of the fighting forces. step of a similar nature was taken when on Oct. 3 the sovi system of free universal education in all grades was altered require payment of tuition in high schools and colleges. St dents in the eighth, ninth and tenth grades were ordered to pa 200 roubles yearly in the cities and 150 in the towns and v lages, while tuition in the colleges amounted to 400 roubl yearly, and in the art, music and theatre schools to 500 rouble The change was motivated officially by the increased expens of the government and by the rising material level of the wor ers, though the standard of life in the soviet union still remain extremely low. On the 23rd anniversary of the foundation of t soviet union the usual military parade was accompanied by t proclamation of full preparedness on the part of the soviet unio and the need of "maximum vigilance in an exceptionally alarm ing international situation."

While communism in the soviet union thus armed to the u most and enforced the strictest labour discipline in the factori and military discipline in the armies, communists outside t soviet union conducted a violent propaganda campaign again full rearmament of the democracies, against discipline in t factories, and often tried to sabotage all efforts to put t democracies on a basis of preparedness similar to that which t soviet union boasted. Communists in France co-operated wi the fascist groups in undermining the will to defence of t French people, and especially of the French working class, again national socialist Germany. In Great Britain the communis were in the front rank of the "appeasers," pleading for the imm diate cessation of hostilities against Germany. In the Unite States, and similarly in other American republics, the Communi party pursued a similar policy, aligning itself with the "appea ers" of the right wing, protesting the rearmament, and tryi generally to undermine the will to and preparations for resistan to fascist aggression, as they had done in France. To that e they were ready to co-operate with extreme pacifists and wi pro-fascist groups.

Communism extended its hold through the incorporation southern Finland, Bessarabia, northern Bukovina, Lithuan Latvia and Estonia into the soviet union. These newly acquire territories were quickly subjected, as eastern Poland had been 1939, to a complete co-ordination of their political, cultur and economic life along communist lines. In all fascist countri communist activities were strictly forbidden, though Chancell Hitler seemed ready to make use of communism to disintegra the nations which he considered antagonistic to his aspirations, General Ludendorff had used Lenin and his fellow-communists f the purpose of disintegrating Russia in 1917. Chancellor Hitl apparently thought Germany immune to communist penetratio while he favoured the propagation of communist social revol tions outside Germany. In democratic countries the Communi party, as a result of its dubious attitude in the struggle betwee fascism and democracy, made hardly any headway, although was given full liberty of action in Great Britain in spite of t serious war situation. In the United States the Communi party, in order to escape the requirements intended for grou under foreign control, dissolved its formal ties with the sovi union, because the cause of proletarian internationalism wou best be served by temporarily severing all affiliations with t communist international. Similarly the official organ of the Co munist party in the United States, the *Daily Worker,* was const tuted as the private property of three individuals. The Communi party participated in the presidential elections of Nov. 1940. I

candidate was, as in 1936, Earl Browder. In spite of the fact that the party was not admitted to the ballot in all states, the party received 48,789 votes, as compared with 80,159 in 1936 and 102,991 in 1932. (*See* also DEMOCRACY; FASCISM; PACIFISM; SOCIALISM.) (H. Ko.)

Communist Party. Outside the U.S.S.R. and the territories it acquired during 1940, the Communist party continued its decline in influence which began with the Russo-German pact of non-aggression in 1939. In the U.S. national election of Nov. 5, 1940, Earl Browder, the party's presidential candidate, and James W. Ford, a Negro from New York who ran for vice-president, polled 48,789 votes. In 1936 the communist presidential vote was 80,159; in 1932, 102,991. The party appeared on the ballots of only 22 states, having been barred in some (notably New York and Illinois) and having failed to qualify in others by securing the required number of petitions. Of the states which permitted balloting for Browder and Ford, California tabulated the largest number of communist votes (13,586), with New Jersey second (8,814) and Pennsylvania third (4,519). The party failed to qualify in Ohio. During 1940, Browder, for reasons of political expediency, dissolved the party's ties with Moscow.

In Mexico, President Avila Camacho made a pre-election promise on Sept. 19 that communists would hold no official positions in his administration. France's stringent control of communist activities, begun after the start of war in 1939, did not change after her defeat by Germany.

Thousands of Moscow's adherents were arrested or interned during a series of raids in October. In May Great Britain began a round-up of communists and fascists as a precaution against fifth-column activities after the start of Germany's big military drive to the west. Ted Bramley, leader of the communist party in London, was arrested May 26.

Community Chest, a term used to describe a local co-operative organization of citizens and social welfare agencies. It has two general functions: (1) to raise funds each year by a community-wide appeal for affiliated social welfare and health agencies and to distribute those funds by a budget procedure; and (2) to promote the social welfare and health of the community by co-ordinating services, improving standards, studying local problems and developing better public understanding. Closely allied with the community chest is the Council of Social Agencies.

In 1940 there were 550 community chests, 534 of them in continental United States, one in the Virgin Islands, two in Hawaii, 11 in Canada and two in South Africa. Almost every city in the United States with more than 100,000 population has a community chest or similar plan of federated financing for its voluntary welfare services. In 1940, 552 campaigns were reported, raising a total of approximately $86,000,000. The 523 chests reporting campaign results for both 1939 and 1940 showed an average increase of 3·5% for 1940 as compared with 1939.

The all-time peak for community chests was $101,181,949, raised in 1932 when private agencies were trying to cope with unemployment relief before Federal relief was under way. Subsequently chest funds declined somewhat until 1936. In that year the decline halted and chest funds have increased steadily since, with the exception of a lag of about 3% in 1939 below 1938, when they had reached 90·2% of 1929 funds.

Community Chests and Councils, Inc., 155 East 44th st., New York city, the national organization of community chests and councils of social agencies, was organized in 1918 as a clearing house for information for the 21 chests then organized. There are 346 community chests and councils of social agencies affiliated with the organization on a voluntary membership basis. A board of directors and an executive committee composed of chest and council laymen and executives guide the organization's policies. It is financed by dues from its corporate members.

An important activity of Community Chests and Councils, Inc., is administration of the annual Community Mobilization for Human Needs, which is sponsored by 36 co-operating national social agencies to give nation-wide backing to local campaigns.

Officers for 1940–41 are George E. Vincent, honorary president; Robert Cutler, president; John Stewart Bryan, Kenneth Sturges, vice-presidents; J. Herbert Case, treasurer; Lynn D. Mowat, secretary.

Allen T. Burns is executive vice-president. (A. T. B.)

Community Trusts. Philanthropic resources lodged in 78 community foundations established since 1914—principally in continental United States but with several in Canada and one in Hawaii—rose in 1940 to approximately $52,000,000.

The aggregate resources of community trusts reached $25,000,000 in 1928 and $50,000,000 in 1939. Their combined appropriations in 1939 totalled $1,278,000. The largest of these foundations, measured by capital held at the beginning of 1940, were the Chicago Community trust with funds aggregating $9,700,000 and the New York Community trust with assets of $8,800,000, followed by those in Cleveland, Boston, Winnipeg, Indianapolis and Minneapolis. (R. Hs.)

Confectionery: *see* CANDY.

Congo, Belgian: *see* BELGIAN COLONIAL EMPIRE; BELGIUM.

Congregational Church. There are in the United States 6,041 churches with 1,049,575 members in the Congregational Christian denomination. The records for 1939 show an increase of 6,299 in net membership of the churches. These churches raised $1,907,439 for benevolences and $14,767,254 for the support of the local congregations.

A Congregational church is a church of self-governing Christian believers organized on a democratic basis in close association with a great body of Congregational churches throughout the world, covenanting together for religious worship, work and fellowship, acknowledging Christ only as authoritative head. Congregational churches were first organized in England in the 16th century, in revolt against state control of religious worship, in the demand for personal Christian experience and in an effort to reproduce New Testament simplicity and democracy.

The old world and the new are indebted chiefly to Congregationalism for the establishment and progress of the principle of religious toleration. Congregationalism sailed to America in the "Mayflower" as the church of the Pilgrim Fathers. Settling first at Plymouth, then later fusing with the Puritan colonists that followed them, these founders of Congregationalism spread over New England and through their democratic ideals laid the foundations for the free church, the free state, the free school and the free social life of the country. The Congregational churches have been pioneer Protestant churches in the promotion of education, missions, evangelism and in movements for Christian union, religious progress and moral reform.

International Congregationalism maintains an international organization known as the International Council of Congregational Churches. This body meets once in ten years, and publishes a decennial volume on the life and work of the Congregational churches around the world. Normally, a meeting of this council would have been held in Wellesley, Mass., in 1940, but on account of war conditions it was postponed until peace comes.

The principal regions in which Congregational churches flourish are shown in the table.

Principal Locations of Congregational Churches and Membership

Countries	Places of Service	Members of Churches	Countries	Places of Service	Members of Churches
Africa	2,314	70,743	Jamaica	56	2,670
Argentina	39	2,940	Japan	198	32,749
Australia and New Zealand	507	21,131	Madagascar	1,945	39,462
Brazil	53	6,349	Mexico	17	290
British Guiana	47	4,270	Near East	133	4,969
Bulgaria	28	890	Newfoundland	6	372
Canada	7,122	707,264	Papua	97	2,119
China	2,481	128,496	Philippines	97	6,410
Czechoslovakia	36	4,322	Scotland	162	39,949
England and Wales	4,457	416,442	South Sea Islands	146	10,715
India and Ceylon	1,722	53,499	Sweden	2,256	109,615
Ireland	43	1,037	United States, including Hawaii	6,041	1,049,575
			TOTAL	29,403	1,725,278

The international moderator is the Rev. J. D. Jones of Bournemouth, England. The British office is at Memorial hall, Farringdon st., London.

The national offices of the General Council of the Congregational Christian Churches were, in 1940, at 287 Fourth avenue, New York, N.Y. (F. L. F.)

Congress, United States. The 77th U.S. Congress met for its first session Jan. 3, 1941. It comprised the following members (as of Dec. 26, 1940):

United States Senate (*re-elected in 1940)

Presiding Officer: Henry A. Wallace, Vice-President (after January 20)

Majority Leader: Alben W. Barkley, of Kentucky

Minority Leader: Charles L. McNary, of Oregon

State	Name	Party	Term Expires	Residence
Ala.	Bankhead, John H.	Dem.	1943	Jasper
	Hill, Lister	Dem.	1945	Montgomery
Ariz.	McFarland, Ernest W.	Dem.	1947	Florence
	Hayden, Carl	Dem.	1945	Phoenix
Ark.	Caraway, Hattie W.	Dem.	1945	Jonesboro
	Miller, John E.	Dem.	1943	Searcy
Calif.	*Johnson, Hiram W.	Rep.	1947	San Francisco
	Downey, Sheridan	Dem.	1945	Atherton
Colo.	Adams, Alva B.	Dem.	1945	Pueblo
	Johnson, Edwin C.	Dem.	1943	Denver
Conn.	Danaher, John A.	Rep.	1945	Hartford
	*Maloney, Francis T.	Dem.	1947	Meriden
Del.	Tunnell, James M.	Dem.	1947	Georgetown
	Hughes, James H.	Dem.	1943	Dover
Fla.	Pepper, Claude	Dem.	1945	Tallahassee
	*Andrews, Charles O.	Dem.	1947	Orlando
Ga.	George, Walter F.	Dem.	1945	Vienna
	Russell, Richard B., Jr.	Dem.	1943	Winder
Ida.	Thomas, John	Rep.	1943	Gooding
	Clark, D. Worth	Dem.	1945	Pocatello
Ill.	Brooks, C. Wayland	Rep.	1943	Chicago
	Lucas, Scott W.	Dem.	1945	Havana
Ind.	Van Nuys, Frederick	Dem.	1945	Indianapolis
	Willis, Raymond E.	Rep.	1947	Angola
Iowa	Gillette, Guy M.	Dem.	1945	Cherokee
	Herring, Clyde La V.	Dem.	1943	Des Moines
Kan.	Capper, Arthur	Rep.	1943	Topeka
	Reed, Clyde M.	Rep.	1945	Parsons
Ky.	Barkley, Alben W.	Dem.	1945	Paducah
	Chandler, A. B.	Dem.	1943	Versailles
La.	Overton, John H.	Dem.	1945	Alexandria
	Ellender, Allen J.	Dem.	1943	Houma
Me.	Brewster, Ralph O.	Rep.	1947	Dexter
	White, Wallace H., Jr.	Rep.	1943	Auburn
Md.	Tydings, Millard E.	Dem.	1945	Havre de Grace
	*Radcliffe, George L.	Dem.	1947	Baltimore
Mass.	*Walsh, David I.	Dem.	1947	Clinton
	Lodge, Henry C., Jr.	Rep.	1943	Beverly
Mich.	*Vandenberg, Arthur H.	Rep.	1947	Grand Rapids
	Brown, Prentiss M.	Dem.	1943	St. Ignace
Minn.	*Shipstead, Henrik	Rep.	1947	Miltona
	Ball, Joseph H.[1]	Rep.	1943	St. Paul
Miss.	Harrison, Pat	Dem.	1943	Gulfport
	*Bilbo, Theodore G.	Dem.	1947	Poplarville
Mo.	Clark, Bennett C.	Dem.	1945	St. Louis
	*Truman, Harry S.	Dem.	1947	Independence
Mont.	*Wheeler, Burton K.	Dem.	1947	Butte
	Murray, James E.	Dem.	1943	Butte
Neb.	Norris, George W.	Ind.	1943	McCook
	Butler, Hugh A.	Rep.	1947	Omaha
Nev.	Bunker, Berkeley L.[2]	Dem.	1947	Las Vegas
	McCarran, Patrick A.	Dem.	1945	Reno
N.H.	Tobey, Charles W.	Rep.	1945	Temple
	Bridges, H. Styles	Rep.	1943	Concord
N.J.	Smathers, William H.	Dem.	1943	Margate City
	*Barbour, W. Warren	Rep.	1947	Locust
N.M.	Hatch, Carl A.	Dem.	1943	Clovis
	*Chavez, Dennis	Dem.	1947	Albuquerque
N.Y.	*Mead, James M.	Dem.	1947	Buffalo
	Wagner, Robert F.	Dem.	1945	New York ci
N.C.	Bailey, Josiah W.	Dem.	1943	Raleigh
	Reynolds, Robert R.	Dem.	1945	Asheville
N.D.	Langer, William	Rep.	1947	Bismarck
	Nye, Gerald P.	Rep.	1945	Cooperstown
Ohio	Taft, Robert A.	Rep.	1945	Cincinnati
	Burton, Harold H.	Rep.	1947	Cleveland
Okla.	Thomas, Elmer	Dem.	1945	Medicine Par
	Lee, Josh	Dem.	1943	Norman
Ore.	McNary, Charles L.	Rep.	1943	Salem
	Holman, Rufus C.	Rep.	1945	Portland
Pa.	Davis, James J.	Rep.	1945	Pittsburgh
	*Guffey, Joseph F.	Dem.	1947	Pittsburgh
R.I.	*Gerry, Peter G.	Dem.	1947	Warwick
	Green, Theodore F.	Dem.	1943	Providence
S.C.	Smith, Ellison DuB.	Dem.	1945	Lynchburg
	Byrnes, James F.	Dem.	1943	Spartanburg
S.D.	Bulow, William J.	Dem.	1943	Beresford
	Gurney, Chan	Rep.	1945	Yankton
Tenn.	*McKellar, Kenneth	Dem.	1947	Memphis
	Stewart, Tom	Dem.	1943	Winchester
Tex.	Sheppard, Morris	Dem.	1943	Texarkana
	*Connally, Tom	Dem.	1947	Marlin
Utah	Murdock, Abe	Dem.	1947	Beaver
	Thomas, Elbert D.	Dem.	1945	Salt Lake Cit
Vt.	*Austin, Warren R.	Rep.	1947	Burlington
	Aiken, George D.	Rep.	1945	Putney
Va.	Glass, Carter	Dem.	1943	Lynchburg
	*Byrd, Harry F.	Dem.	1947	Berryville
Wash.	Bone, Homer T.	Dem.	1945	Tacoma
	Wallgren, Mon C.	Dem.	1947	Everett
W.Va.	Neely, Matthew M. (resigned)	Dem.	1943	Fairmont
	Kilgore, Harley M.	Dem.	1947	Beckley
Wis.	*LaFollette, Robert M., Jr.	Pro.	1947	Madison
	Wiley, Alexander	Rep.	1945	Chippewa Fa
Wyo.	*O'Mahoney, Joseph C.	Dem.	1947	Cheyenne
	Schwartz, Harry H.	Dem.	1943	Casper

[1]Appointed Oct. 14, 1940 to fill vacancy caused by death of Ernest Lunde Aug. 31, 1940.

[2]Appointed Nov. 27, 1940 to fill vacancy caused by death of Key Pittm Nov. 10, 1940.

United States House of Representatives (*served in 76 Congress)

Speaker: Sam Rayburn, of Texas

Majority Leader: John W. McCormack, of Massachuset

Minority Leader: Joseph W. Martin, Jr., of Massachuset

State	Dist.	Name	Party	Residence
Ala.	1	*Boykin, Frank W.	Dem.	Mobile
	2	*Grant, George M.	Dem.	Troy
	3	*Steagall, Henry B.	Dem.	Ozark
	4	*Hobbs, Sam	Dem.	Selma
	5	*Starnes, Joe	Dem.	Guntersville
	6	*Jarman, Pete	Dem.	Livingston
	7	Bankhead, Walter W.	Dem.	Jasper
	8	*Sparkman, John J.	Dem.	Huntsville
	9	*Patrick, Luther	Dem.	Birmingham
Ariz.		*Murdock, John R.	Dem.	Tempe
Ark.	1	*Gathings, E. C.	Dem.	West Memphis
	2	*Mills, Wilbur D.	Dem.	Kensett
	3	*Ellis, Clyde T.	Dem.	Bentonville
	4	*Cravens, Fadjo	Dem.	Fort Smith
	5	*Terry, David D.	Dem.	Little Rock
	6	*Norrell, W. F.	Dem.	Monticello
	7	Harris, Oren	Dem.	El Dorado
Calif.	1	*Lea, Clarence F.	Dem.	Santa Rosa
	2	*Englebright, Harry L.	Rep.	Nevada City
	3	*Buck, Frank H.	Dem.	Vacaville
	4	Rolph, Thomas	Rep.	San Francisco
	5	*Welch, Richard J.	Rep.	San Francisco
	6	*Carter, Albert E.	Rep.	Oakland
	7	*Tolan, John H.	Dem.	Oakland
	8	*Anderson, John Z.	Rep.	San Juan Bautis
	9	*Gearhart, Bertrand W	Rep.	Fresno
	10	*Elliott, Albert J.	Dem.	Tulare
	11	*Hinshaw, Carl	Rep.	Pasadena
	12	*Voorhis, Jerry	Dem.	San Dimas
	13	*Kramer, Charles	Dem.	Los Angeles

State	Dist.	Name	Party	Residence
Calif.	14	*Ford, Thomas F.	Dem.	Los Angeles
	15	*Costello, John M.	Dem.	Hollywood
	16	*Ford, Leland M.	Rep.	Santa Monica
	17	*Geyer, Lee E.	Dem.	Gardena
	18	Johnson, Ward	Rep.	Long Beach
	19	*Sheppard, Harry R.	Dem.	Yucaipa
	20	*Izac, Edouard V. M.	Dem.	San Diego
Colo.	1	*Lewis, Lawrence	Dem.	Denver
	2	Hill, William S.	Rep.	Fort Collins
	3	Chenoweth, J. Edgar	Rep.	Trinidad
	4	*Taylor, Edward T.	Dem.	Glenwood Springs
Conn.		Maciora, Lucien J.	Dem.	New Britain
	1	Kopplemann, Herman P.	Dem.	Hartford
	2	Fitzgerald, William J.	Dem.	Norwich
	3	*Shanley, James A.	Dem.	New Haven
	4	Downs, Le Roy D.	Dem.	South Norwalk
	5	*Smith, J. Joseph	Dem.	Waterbury
Del.		Traynor, Philip A.	Dem.	Wilmington
Fla.	1	*Peterson, J. Harden	Dem.	Lakeland
	2	*Green, Lex.	Dem.	Starke
	3	Sikes, Robert L. F.	Dem.	Crestview
	4	*Cannon, Pat	Dem.	Miami
	5	*Hendricks, Joe	Dem.	De Land
Ga	1	*Peterson, Hugh	Dem.	Ailey
	2	*Cox, Edward E.	Dem.	Camilla
	3	*Pace, Stephen	Dem.	Americus
	4	*Camp, Albert S.	Dem.	Newnan
	5	*Ramspeck, Robert	Dem.	Atlanta
	6	*Vinson, Carl	Dem.	Milledgeville
	7	*Tarver, Malcolm C.	Dem.	Dalton
	8	*Gibson, John S.	Dem.	Douglas
	9	*Whelchel, B. Frank	Dem.	Gainesville
	10	*Brown, Paul	Dem.	Elberton
Ida.	1	*White, Compton I.	Dem.	Clark Fork
	2	*Dworshak, Henry C.	Rep.	Burley
Ill.		Stratton, William G.	Rep	Morris
		Day, Stephen A.	Rep.	Evanston
	1	Mitchell, Arthur W.	Dem.	Chicago
	2	*McKeough, Raymond S.	Dem.	Chicago
	3	*Kelly, Edward A.	Dem.	Chicago
	4	*Beam, Harry P.	Dem.	Chicago
	5	*Sabath, Adolph J.	Dem.	Chicago
	6	*Maciejewski, A. F.	Dem.	Chicago
	7	*Schuetz, Leonard W.	Dem.	Chicago
	8	*Kocialkowski, Leo	Dem.	Chicago
	9	Dewey, Charles S.	Rep.	Chicago
	10	Paddock, George A.	Rep.	Evanston
	11	*Reed, Chauncey W.	Rep.	West Chicago
	12	*Mason, Noah M.	Rep.	Oglesby
	13	*Allen, Leo E.	Rep.	Galena
	14	*Johnson, Anton J.	Rep.	Macomb
	15	*Chiperfield, Robert B.	Rep.	Canton
	16	*Dirksen, Everett McK	Rep.	Pekin
	17	*Arends, Leslie C.	Rep.	Melvin
	18	*Sumner, Jessie	Rep.	Milford
	19	*Wheat, William H.	Rep.	Rantoul
	20	*Barnes, James M.	Dem.	Jacksonville
	21	Howell, Evan	Rep.	Springfield
	22	*Schaefer, Edwin M.	Dem.	Belleville
	23	*Arnold, Laurence F.	Dem.	Newton
	24	Heidinger, James V.	Rep.	Fairfield
	25	Bishop, C. W.	Rep.	Carterville
Ind.	1	*Schulte, William T.	Dem.	Hammond
	2	*Halleck, Charles A.	Rep.	Rensselaer
	3	*Grant, Robert A.	Rep.	South Bend
	4	*Gillie, George W.	Rep.	Fort Wayne
	5	*Harness, Forest A.	Rep.	Kokomo
	6	*Johnson, Noble J.	Rep.	Terre Haute
	7	*Landis, Gerald W.	Rep.	Linton
	8	*Boehne, John W., Jr.	Dem.	Evansville
	9	Wilson, Earl	Rep.	Huron
	10	*Springer, Raymond S.	Rep.	Connersville
	11	*Larrabee, William H.	Dem.	New Palestine
	12	*Ludlow, Louis	Dem.	Indianapolis
Iowa	1	*Martin, Thomas E.	Rep.	Iowa City
	2	*Jacobsen, William S.	Dem.	Clinton
	3	*Gwynne, John W.	Rep.	Waterloo
	4	*Talle, Henry O.	Rep.	Decorah
	5	*Le Compte, Karl M.	Rep.	Corydon
	6	Cunningham, Paul	Rep.	Des Moines
	7	*Jensen, Ben F.	Rep.	Exira
	8	*Gilchrist, Fred C.	Rep.	Laurens
	9	*Harrington, Vincent F.	Dem.	Sioux City
Kan.	1	*Lambertson, William P.	Rep.	Fairview
	2	*Guyer, Ulysses S.	Rep.	Kansas City
	3	*Winter, Thomas D.	Rep.	Girard
	4	*Rees, Edward H.	Rep.	Emporia
	5	*Houston, John M.	Dem.	Newton
	6	*Carlson, Frank	Rep.	Concordia
	7	*Hope, Clifford R.	Rep.	Garden City
Ky.	1	*Gregory, Noble J.	Dem.	Mayfield
	2	*Vincent, Beverly M.	Dem.	Brownville
	3	*O'Neal, Emmet	Dem.	Louisville
	4	*Creal, Edward W.	Dem.	Hodgenville
	5	*Spence, Brent	Dem.	Fort Thomas
	6	*Chapman, Virgil	Dem.	Paris
	7	*May, Andrew J.	Dem.	Prestonsburg
	8	*Bates, Joe B.	Dem.	Greenup
Ky.	9	*Robsion, John M.	Rep.	Barbourville
La.	1	Hebert, F. Edward	Dem.	New Orleans
	2	Boggs, Hale	Dem.	New Orleans
	3	Domengeaux, James	Dem.	Lafayette
	4	*Brooks, Overton	Dem.	Shreveport
	5	*Mills, Newt V.	Dem.	Mer Rouge
	6	Sanders, Jared Y., Jr.	Dem.	Baton Rouge
	7	Plauché, Vance	Dem.	Lake Charles
	8	*Allen, A. Leonard	Dem.	Winnfield
Me.	1	*Oliver, James C.	Rep.	South Portland
	2	*Smith, Margaret Chase	Rep.	Skowhegan
	3	Fellows, Frank	Rep.	Bangor
Md.	1	*Ward, David J.	Dem.	Salisbury
	2	*Cole, William P., Jr.	Dem.	Towson
	3	*D'Alesandro, Thomas, Jr.	Dem.	Baltimore
	4	Meyer, John A.	Dem.	Baltimore
	5	*Sasscer, Lansdale G.	Dem.	Upper Marlboro
	6	*Bryon, William D.	Dem.	Williamsport
Mass.	1	*Treadway, Allen T.	Rep.	Stockbridge
	2	*Clason, Charles R.	Rep.	Springfield
	3	*Casey, Joseph E.	Dem.	Clinton
	4	*Holmes, Pehr G.	Rep.	Worcester
	5	*Rogers, Edith N.	Rep.	Lowell
	6	*Bates, George J.	Rep.	Salem
	7	*Connery, Lawrence J.	Dem.	Lynn
	8	*Healey, Arthur D.	Dem.	Somerville
	9	Eliot, Thomas H.	Dem.	Cambridge
	10	*Tinkham, George H.	Rep.	Boston
	11	*Flaherty, Thomas A.	Dem.	Boston
	12	*McCormack, John W.	Dem.	Boston
	13	*Wigglesworth, Richard B.	Rep.	Milton
	14	*Martin, Joseph W., Jr.	Rep.	North Attleboro
	15	*Gifford, Charles L.	Rep.	Barnstable
Mich.	1	*Tenerowicz, Rudolph G.	Dem.	Hamtramck
	2	*Michener, Earl C.	Rep.	Adrian
	3	*Shafer, Paul W.	Rep.	Battle Creek
	4	*Hoffman, Clare E.	Rep.	Allegan
	5	*Jonkman, Bartel J.	Rep.	Grand Rapids
	6	*Blackney, William W.	Rep.	Flint
	7	*Wolcott, Jesse P.	Rep.	Port Huron
	8	*Crawford, Fred L.	Rep.	Saginaw
	9	*Engel, Albert J.	Rep.	Lake City
	10	*Woodruff, Roy O.	Rep.	Bay City
	11	*Bradley, Fred	Rep.	Rogers City
	12	*Hook, Frank E.	Dem.	Ironwood
	13	O'Brien, George D.	Dem.	Detroit
	14	*Rabaut, Louis C.	Dem.	Grosse Pointe Park
	15	*Dingell, John D.	Dem.	Detroit
	16	*Lesinski, John	Dem.	Dearborn
	17	*Dondero, George A.	Rep.	Royal Oak
Minn.	1	*Andresen, August H.	Rep.	Red Wing
	2	O'Hara, Joseph P.	Rep.	Glencoe
	3	Gale, Richard P.	Rep.	Mound
	4	*Maas, Melvin J.	Rep.	St. Paul
	5	*Youngdahl, Oscar	Rep.	Minneapolis
	6	*Knutson, Harold	Rep.	St. Cloud
	7	*Andersen, H. Carl	Rep.	Tyler
	8	*Pittenger, William A.	Rep.	Duluth
	9	*Buckler, Richard T.	F.L.	Crookston
Miss.	1	*Rankin, John E.	Dem.	Tupelo
	2	*Doxey, Wall	Dem.	Holly Springs
	3	*Whittington, William M.	Dem.	Greenwood
	4	*Ford, Aaron L.	Dem.	Ackerman
	5	*Collins, Ross A.	Dem.	Meridian
	6	*Colmer, William M.	Dem.	Pascagoula
	7	*McGehee, Dan R.	Dem.	Meadville
Mo.	1	*Romjue, Milton A.	Dem.	Macon
	2	*Nelson, William L.	Dem.	Columbia
	3	*Duncan, Richard M.	Dem.	St. Joseph
	4	*Bell, C. Jasper	Dem.	Blue Springs
	5	*Shannon, Joseph B.	Dem.	Kansas City
	6	Bennett, Philip A.	Rep.	Springfield
	7	*Short, Dewey	Rep.	Galena
	8	*Williams, Clyde	Dem.	Hillsboro
	9	*Cannon, Clarence	Dem.	Elsberry
	10	*Zimmerman, Orville	Dem.	Kennett
	11	Sullivan, John B.	Dem.	St. Louis
	12	Ploeser, Walter C.	Rep.	St. Louis
	13	*Cochran, John J.	Dem.	St. Louis
Mont.	1	Rankin, Jeannette	Rep.	Missoula
	2	*O'Connor, James F.	Dem.	Livingston
Neb.	1	Copeland, Oren S.	Rep.	Lincoln
	2	*McLaughlin, Charles F.	Dem.	Omaha
	3	*Stefan, Karl	Rep.	Norfolk
	4	*Curtis, Carl T.	Rep.	Minden
	5	*Coffee, Harry B.	Dem.	Chadron
Nev.		*Scrugham, James G.	Dem.	Reno
N.H.	1	*Jenks, Arthur B.	Rep.	Manchester
	2	*Stearns, Foster	Rep.	Hancock
N.J.	1	*Wolverton, Charles A.	Rep.	Merchantville
	2	Wene, Elmer H.	Dem.	Vineland
	3	*Sutphin, William H.	Dem.	Matawan
	4	*Powers, D. Lane	Rep.	Trenton
	5	*Eaton, Charles A.	Rep.	Watchung
	6	*McLean, Donald H.	Rep.	Elizabeth
	7	*Thomas, J. Parnell	Rep.	Allendale
	8	Canfield, Gordon	Rep.	Paterson
	9	*Osmers, Frank C., Jr.	Rep.	Haworth

State	Dist.	Name	Party	Residence
N.J.	10	*Hartley, Fred A., Jr.	Rep.	Kearny
	11	*Vreeland, Albert L.	Rep.	East Orange
	12	*Kean, Robert W.	Rep.	Livingston
	13	*Norton, Mary T.	Dem.	Jersey City
	14	*Hart, Edward J.	Dem.	Jersey City
N.M.		Anderson, Clinton P.	Dem.	Albuquerque
N.Y.		*Merritt, Matthew J.	Dem.	Flushing
		*O'Day, Caroline	Dem.	Rye
	1	*Hall, Leonard W.	Rep.	Oyster Bay
	2	*Barry, William B.	Dem.	Hollis
	3	*Pfeifer, Joseph L.	Dem.	Brooklyn
	4	*Cullen, Thomas H.	Dem.	Brooklyn
	5	Heffernan, James J.	Dem.	Brooklyn
	6	*Somers, Andrew L.	Dem.	Brooklyn
	7	*Delaney, John J.	Dem.	Brooklyn
	8	*O'Toole, Donald L.	Dem.	Brooklyn
	9	*Keogh, Eugene J.	Dem.	Brooklyn
	10	*Celler, Emanuel	Dem.	Brooklyn
	11	*O'Leary, James A.	Dem.	W. New Brighton
	12	*Dickstein, Samuel	Dem.	New York city
	13	Capozzoli, Louis J.	Dem.	New York city
	14	*Edelstein, M. Michael	Dem.	New York city
	15	*Kennedy, Michael J.	Dem.	New York city
	16	Pheiffer, William T.	Rep.	New York city
	17	Simpson, Kenneth F.	Rep.	New York city
	18	*Kennedy, Martin J.	Dem.	New York city
	19	*Bloom, Sol	Dem.	New York city
	20	*Marcantonio, Vito	Am.Lab.	New York city
	21	*Gavagan, Joseph A.	Dem.	New York city
	22	*Lynch, Walter A.	Dem.	Bronx
	23	*Buckley, Charles A.	Dem.	Bronx
	24	*Fitzpatrick, James M.	Dem.	Bronx
	25	*Gamble, Ralph A.	Rep.	Larchmont
	26	*Fish, Hamilton	Rep.	Garrison
	27	*Rockefeller, Lewis K.	Rep.	Chatham
	28	*Byrne, William T.	Dem.	Loudonville
	29	*Cluett, E. Harold	Rep.	Troy
	30	*Crowther, Frank	Rep.	Schenectady
	31	*Kilburn, Clarence E.	Rep.	Malone
	32	*Culkin, Francis D.	Rep.	Oswego
	33	*Douglas, Fred J.	Rep.	Utica
	34	*Hall, Edwin A.	Rep.	Binghamton
	35	*Hancock, Clarence E.	Rep.	Syracuse
	36	*Taber, John	Rep.	Auburn
	37	*Cole, W. Sterling	Rep.	Bath
	38	*O'Brien, Joseph J.	Rep.	East Rochester
	39	*Wadsworth, James W.	Rep.	Geneseo
	40	*Andrews, Walter G.	Rep.	Buffalo
	41	Beiter, Alfred F.	Dem.	Williamsville
	42	*Schwert, Pius L.	Dem.	Buffalo
	43	*Reed, Daniel A.	Rep.	Dunkirk
N C	1	*Bonner, Herbert C.	Dem.	Washington
	2	*Kerr, John H.	Dem.	Warrenton
	3	*Barden, Graham A.	Dem.	New Bern
	4	*Cooley, Harold D.	Dem.	Nashville
	5	*Folger, Alonzo D.	Dem.	Mount Airy
	6	*Durham, Carl T.	Dem.	Chapel Hill
	7	*Clark, J. Bayard	Dem.	Fayetteville
	8	*Burgin, William O.	Dem.	Lexington
	9	*Doughton, Robert L.	Dem.	Laurel Springs
	10	*Bulwinkle, Alfred L.	Dem.	Gastonia
	11	*Weaver, Zebulon	Dem.	Asheville
N.D.		*Burdick, Usher L.	Rep.	Williston
		Robertson, Charles R.	Rep.	Bismarck
Ohio		*Bender, George H.	Rep.	Cleveland Heights
		Young, Stephen M.	Dem.	Cleveland
	1	*Elston, Charles H.	Rep.	Newtown
	2	*Hess, William E.	Rep.	Cincinnati
	3	Holbrock, Greg	Dem.	Hamilton
	4	*Jones, Robert F.	Rep.	Lima
	5	*Clevenger, Cliff	Rep.	Bryan
	6	Davis, Jacob E.	Dem.	Waverly
	7	*Brown, Clarence J.	Rep.	Blanchester
	8	*Smith, Frederick C.	Rep.	Marion
	9	*Hunter, John F.	Dem.	Toledo
	10	*Jenkins, Thomas A.	Rep.	Ironton
	11	*Claypool, Harold K.	Dem.	Chillicothe
	12	*Vorys, John M.	Rep.	Columbus
	13	Baumhart, A. D., Jr.	Rep.	Vermilion
	14	*Harter, Dow W.	Dem.	Akron
	15	*Secrest, Robert T.	Dem.	Caldwell
	16	Thom, William R.	Dem.	Canton
	17	*McGregor, J. Harry	Rep.	Coshocton
	18	Imhoff, Lawrence E.	Dem.	St. Clairsville
	19	*Kirwan, Michael J.	Dem.	Youngstown
	20	*Sweeney, Martin L.	Dem.	Cleveland
	21	*Crosser, Robert	Dem.	Cleveland
	22	*Bolton, Frances P.	Rep.	Cleveland
Okla.		*Rogers, Will	Dem.	Oklahoma City
	1	*Disney, Wesley E.	Dem.	Tulsa
	2	*Nichols, Jack	Dem.	Eufaula
	3	*Cartwright, Wilburn	Dem.	McAlester
	4	*Boren, Lyle H.	Dem.	Seminole
	5	*Monroney, Mike	Dem.	Oklahoma City
	6	*Johnson, Jed	Dem.	Anadarko
	7	*Massingale, Sam C.	Dem.	Cordell
	8	Rizley, Ross	Rep.	Guymon
Ore	1	*Mott, James W.	Rep.	Salem
Ore.	2	*Pierce, Walter M.	Dem.	La Grande
	3	*Angell, Homer D.	Rep.	Portland
Pa.	1	*Sacks, Leon	Dem.	Philadelphia
	2	*McGranery, James P.	Dem.	Philadelphia
	3	*Bradley, Michael J.	Dem.	Philadelphia
	4	*Sheridan, John E.	Dem.	Philadelphia
	5	Smith, Francis R.	Dem.	Philadelphia
	6	*Myers, Francis J.	Dem.	Philadelphia
	7	Scott, Hugh D., Jr.	Rep.	Philadelphia
	8	*Wolfenden, James	Rep.	Upper Darby
	9	*Gerlach, Charles L.	Rep.	Allentown
	10	*Kinzer, J. Roland	Rep.	Lancaster
	11	*Boland, Patrick J.	Dem.	Scranton
	12	*Flannery, J. Harold	Dem.	Pittston
	13	*Fenton, Ivor D.	Rep.	Mahanoy City
	14	*Moser, Guy L.	Dem.	Douglassville
	15	*Rutherford, Albert G.	Rep.	Honesdale
	16	*Rich, Robert F.	Rep.	Woolrich
	17	*Ditter, J. William	Rep.	Ambler
	18	*Simpson, Richard M.	Rep.	Huntingdon
	19	*Kunkel, John C.	Rep.	Harrisburg
	20	*Jarrett, Benjamin	Rep.	Farrell
	21	*Walter, Francis E.	Dem.	Easton
	22	Haines, Harry L.	Dem.	Red Lion
	23	*Van Zandt, James E.	Rep.	Altoona
	24	*Snyder, J. Buell	Dem.	Perryopolis
	25	*Faddis, Charles I.	Dem.	Waynesburg
	26	*Graham, Louis E.	Rep.	Beaver
	27	*Tibbott, Harve	Rep.	Ebensburg
	28	Kelley, Augustine B.	Dem.	Greensburg
	29	*Rodgers, Robert L.	Rep.	Erie
	30	Scanlon, Thomas E.	Dem.	Pittsburgh
	31	Weiss, Samuel A.	Dem.	Glassport
	32	*Eberharter, Herman P.	Dem.	Pittsburgh
	33	*McArdle, Joseph A.	Dem.	Pittsburgh
	34	Wright, James A.	Dem.	Carnegie
R.I.	1	Forand, Aime J.	Dem.	Central Falls
	2	Fogarty, John E.	Dem.	Harmony
S.C.	1	Rivers, L. Mendel	Dem.	Charleston
	2	*Fulmer, Hampton P.	Dem.	Orangeburg
	3	*Hare, Butler B.	Dem.	Saluda
	4	*Bryson, Joseph R.	Dem.	Greenville
	5	*Richards, James P.	Dem.	Lancaster
	6	*McMillan, John L.	Dem.	Florence
S.D.	1	*Mundt, Karl E.	Rep.	Madison
	2	*Case, Francis	Rep.	Custer
Tenn.	1	*Reece, B. Carroll	Rep.	Johnson City
	2	*Jennings, John, Jr.	Rep.	Knoxville
	3	*Kefauver, Estes	Dem.	Chattanooga
	4	*Gore, Albert	Dem.	Carthage
	5	Priest, J. Percy	Ind.Dem.	Nashville
	6	*Courtney, Wirt	Dem.	Franklin
	7	*Pearson, Herron	Dem.	Jackson
	8	*Cooper, Jere	Dem.	Dyersburg
	9	*Davis, Clifford	Dem.	Memphis
Tex.	1	*Patman, Wright	Dem.	Texarkana
	2	*Dies, Martin	Dem.	Orange
	3	*Beckworth, Lindley	Dem.	Gilmer
	4	*Rayburn, Sam	Dem.	Bonham
	5	*Sumners, Hatton W.	Dem.	Dallas
	6	*Johnson, Luther A.	Dem.	Corsicana
	7	*Patton, Nat	Dem.	Crockett
	8	*Thomas, Albert	Dem.	Houston
	9	*Mansfield, Joseph J.	Dem.	Columbus
	10	*Johnson, Lyndon	Dem.	Austin
	11	*Poage, William R.	Dem.	Waco
	12	*Lanham, Fritz G.	Dem.	Fort Worth
	13	*Gossett, Ed	Dem.	Wichita Falls
	14	*Kleberg, Richard M.	Dem.	Corpus Christi
	15	*West, Milton H.	Dem.	Brownsville
	16	*Thomason, R. Ewing	Dem.	El Paso
	17	Russell, Sam M.	Dem.	Stephenville
	18	Worley, Eugene	Dem.	Shamrock
	19	*Mahon, George H.	Dem.	Colorado
	20	*Kilday, Paul J.	Dem.	San Antonio
	21	*South, Charles L.	Dem.	Coleman
Utah	1	Granger, Walter K.	Dem.	Cedar City
	2	*Robinson, J. Will	Dem.	Provo
Vt.		*Plumley, Charles A.	Rep.	Northfield
Va.	1	*Bland, Schuyler O.	Dem.	Newport News
	2	*Darden, Colgate W., Jr.	Dem.	Norfolk
	3	*Satterfield, Dave E., Jr.	Dem.	Richmond
	4	*Drewry, Patrick H.	Dem.	Petersburg
	5	*Burch, Thomas G.	Dem.	Martinsville
	6	*Woodrum, Clifton A.	Dem.	Roanoke
	7	*Robertson, A. Willis	Dem.	Lexington
	8	*Smith, Howard W.	Dem.	Alexandria
	9	*Flannagan, John W., Jr.	Dem.	Bristol
Wash.	1	*Magnuson, Warren G.	Dem.	Seattle
	2	Jackson, Henry M.	Dem.	Everett
	3	*Smith, Martin F.	Dem.	Hoquiam
	4	*Hill, Knute	Dem.	Prosser
	5	*Leavy, Charles H.	Dem.	Spokane
	6	*Coffee, John M.	Dem.	Tacoma
W.Va.	1	Ramsay, Robert L.	Dem.	Follansbee
	2	*Randolph, Jennings	Dem.	Elkins
	3	*Edmiston, Andrew	Dem.	Weston
	4	*Johnson, George W.	Dem.	Parkersburg

State	Dist.	Name	Party	Residence
W.Va.	5	*Kee, John	Dem.	Bluefield
	6	*Smith, Joe L.	Dem.	Beckley
Wis.	1	*Bolles, Stephen	Rep.	Janesville
	2	Sauthoff, Harry	Pro.	Madison
	3	Stevenson, William H.	Rep.	La Crosse
	4	Wasielewski, Thad F.	Dem.	Milwaukee
	5	*Thill, Lewis D.	Rep.	Milwaukee
	6	*Keefe, Frank B.	Rep.	Oshkosh
	7	*Murray, Reid F.	Rep.	Waupaca
	8	*Johns, Joshua L.	Rep.	Algoma
	9	*Hull, Merlin	Pro.	Black River Falls
	10	*Gehrmann, Bernard J.	Pro.	Mellen
Wyo.		McIntyre, John J.	Dem.	Douglas

Congressional Legislation: *see* LEGISLATION: *Federal;* UNITED STATES.

Congress of Industrial Organizations.

Probably the most significant thing in the affairs of the Congress of Industrial Organizations in 1940 was the retirement of John L. Lewis as president and the election of Philip Murray to succeed him.

Both members of the United Mine Workers of America, mainspring of the movement for industrial unionism which caused a split with the American Federation of Labor in 1935, these two men had been active co-workers for nearly 30 years. They presented a striking contrast, for Mr. Lewis was dramatic and emotional while Mr. Murray was soft spoken and reflective.

Meeting in Nov. 1940, at a time when national defence was a matter of intense interest, the C.I.O. convention, for the first time since it was established as a permanent organization in 1938, adopted a resolution denouncing all isms—communism, naziism and fascism. Previously it had attacked naziism and fascism only. Failure to include communism had evoked considerable criticism, including charges that the C.I.O. had unions which were communist-dominated. Such accusations have always been denied by C.I.O. officials.

Created by Mr. Lewis and a small group of leaders in the A.F. of L. in 1935 as the Committee for Industrial Organization, to work inside the federation as a lever to stimulate formation of industrial unions, the unions in this venture were suspended in 1936 and subsequently most of their charters were revoked. In 1938, retaining the same initials, the name was changed to that of the Congress of Industrial Organizations and Mr. Lewis, up to that time chairman, became its first president, being re-elected in 1939.

No current membership figure was announced at the 1940 convention, but unofficially it was claimed that the C.I.O. had 4,000,000 members. The C.I.O. was in 1940 no longer confined to organizing workers into industrial unions, but it formed craft unions as well, rivalling the A.F. of L. (*See* also AMERICAN FEDERATION OF LABOR; LABOUR UNIONS; STRIKES AND LOCK-OUTS; UNITED STATES.) (L. STA.)

PHILIP MURRAY, new president of the Congress of Industrial Organizations, addressing the C.I.O. convention at Atlantic City, N.J., Nov. 19, 1940, shortly before his election to succeed John L. Lewis

Connecticut, one of the original states of the United States, popularly known as the "Nutmeg state" and the "Land of Steady Habits"; land area, 4,820 sq.mi.; population (U.S. census, 1940), 1,709,242, an increase of 6·4% since 1930 as compared with 16·4% in the ten years preceding 1930. Capital, Hartford, 166,267. Other cities of over 50,000 population in 1940: New Haven, 160,605; Bridgeport, 147,121; Waterbury, 99,314; New Britain, 68,685. The 1940 census showed an increase of population in each of the eight counties and in 19 of the 24 urban communities of over 10,000, the larger increases being in the towns of West Hartford, West Haven, Stratford and East Hartford, all suburban communities. Aside from New Haven, the declines of population in five urban communities were less than 1,000 each. Of the state's population in 1940, 1,158,162 were urban, or 67·8%. In 1930 there were 1,576,673 whites; 29,354 Negroes; 1,222,267 native born; 384,636 foreign born.

History.—The principal state officers in 1940 were: governor, Raymond E. Baldwin; lieutenant governor, James L. McConaughy; secretary of state, Mrs. Sara B. Crawford; chief justice of the supreme court of errors, William M. Maltbie (term 1930–46). The above officers will be succeeded in Jan. 1941 by governor, Robert A. Hurley (Democrat, elected 1940, with 388,361 votes to 374,581 for Baldwin, Republican, and 18,090 for McLevy, Socialist); lieutenant governor, Odell Shepard; secretary of state, Mrs. Chase Going Woodhouse. The presidential vote of the state in 1940 was Roosevelt, 417,621; Willkie, 361,825. Francis T. Maloney, Democrat, was re-elected United States senator. The general assembly of 1941 will consist of 22 Democrats, 13 Republicans in the senate; 88 Democrats, 184 Republicans in the house.

The state income for the fiscal year ended June 30, 1940 was $74,596,669.95 and the net expenditures were $72,195,799.63, leaving a surplus in the general fund of $1,748,808.18. The expenditures from the highway fund were $20,964,984.96; from the building fund for construction and equipment of new institutional buildings $12,078,901.37; from the Unemployment Compensation Benefits fund $5,459,786.52 and from the Old Age Assistance fund $5,418,611.77.

Education and Charities.—In the year 1939–40 the average daily attendance in public high schools was 79,662 and in other public schools 186,172. The school census of 1939 showed 242,427 attending public schools and 53,065 attending private schools and institutions. As a result of an extensive building program conducted by the state in co-operation with the Federal Public Works administration a new school was opened for feeble-minded at South Britain and a new veterans' home at Rocky Hill, and various new buildings and other improvements have greatly enlarged and improved the facilities at the University of Connecticut, at the state hospitals in Middletown and Newtown, at Long Lane farm for girls and at other institutions.

Banking and Finance.—On Sept. 30, 1940, the 72 mutual savings banks in the state had total deposits of $742,861,831 and total assets of $830,623,664, being a considerable increase over the previous year. The number of accounts increased to 984,506. In all but six cases the dividend rate was 2½%. The 64 state banks and trust companies had total assets of $400,685,665, an increase of more than 10% for 1940. Hartford is the headquarters of most of the 25 large insurance companies operating under Connecticut charters. The five life companies of Connecticut wrote 11·12% of the new ordinary life insurance written through-

out the country in 1939 and had 11·01% of such insurance in force in all companies. The number of ordinary life policies issued in Connecticut in 1939 was 82,093, amounting to $131,838,774, being a considerable increase over the preceding year, but the average life policy was $1,606 as compared with $2,079 in 1938. In 1939 Connecticut companies wrote 20·49% of all casualty business in the country. The figures for the Connecticut fire companies for 1939 were favourable, except for some decline in underwriting profit.

ROBERT A. HURLEY, a Democrat, was elected Connecticut's governor Nov. 5, 1940

Highways.—The final section of the Merritt parkway was opened to use in the summer of 1940 and work on its continuation, the Wilbur Cross highway, and on the new bridges across the Connecticut at Hartford and across the Thames at New London, has been in progress. The number of car registrations on Oct. 1, 1940 was 490,421, of licensed operators 564,433, and the number of miles travelled by motor vehicles on Connecticut highways 3,480,968,244. Each showed increases of about 6% over the same period of 1939 and constituted new records. The number of traffic accidents remained approximately the same as for 1939.

Agriculture and Manufacturing.—Agricultural production of the state in 1940 was good. The combined value of livestock products and crops exceeded $50,000,000 annually. The dairy industry led with $20,000,000, tobacco was second with $10,000,000 and poultry raising third with $9,000,000. In addition to tobacco, hay, potatoes and corn were the leading crops and fruit growing and gardening were extensively conducted. Preeminently a manufacturing state, Connecticut is an extensive beneficiary of the national defence program. Large contracts were let to industries in the state, especially in the fields of aviation, small arms and machine tools. By Oct. 1940 the volume of employment in Connecticut industries once more returned to the 1929 level.

Although the working day was much shorter, the daily and weekly earnings were higher than in 1929, and the volume of production greater.

While there was some increase in the number of labour disputes, the number of strikes during 1940 was less. (G. M. Du.)

Conscientious Objectors: *see* Civil Liberties; Pacifism; Selective Service.

Conscription: *see* Selective Service.

Conservation, Soil: *see* Soil Erosion and Soil Conservation.

Conservative Party.

For the third successive year the holding of the British Conservative party's annual conference was cancelled in 1940, but the organization in the constituencies was effectively maintained although the local associations largely transferred their attentions from political work to the various war activities. By the beginning of 1940 more than 100 of the nearly 400 full-time qualified agents attached to the associations in England and Wales at the o break of war were in the armed forces, and more than 60 oth in some form of national service.

The annual meeting of the Central Council of the Natio Union of Conservative and Unionist Associations (the first me ing representative of the whole party organization since w came) took place on April 4, Lord Queenborough—who had h the office in 1928–29—being elected president in succession the marquess of Londonderry. Its main business was the passi of an amendment to a resolution calling for national unity a emphasizing the need for not confining the political truce to b elections, to the effect that the organization should not only its abstain from provoking party feeling but should make kno its appreciation of a similar attitude when adopted by oth political parties. A further resolution condemning the activit of certain peace organizations that were alleged to create atmosphere of defeatism was also adopted. This matter w reopened later in the month when Sir John Anderson, then ho secretary, met the 1922 committee (which consists of the ent body of Conservative back-benchers) and told them of t measures being taken to deal with such societies and with t closer supervision of aliens.

The leader of the party since 1937 had been Neville Chamb lain and he remained as leader even after he had resigned fr the premiership in May 1940, his successor as prime minis not wishing at that time to undertake the leadership of his par In October the state of Mr. Chamberlain's health made it nec sary for his resignation to be accepted, and Winston Church after being elected unanimously, now became leader, since, as was in daily relation with the leaders of the other two parties would be more convenient if he could speak for the Conservati with first-hand knowledge of their outlook on fundamental issu and with their authority. This action of Mr. Churchill's, thou generally welcomed, was a disappointment to those of his su porters who had hoped he would hold himself aloof from pa altogether, or even form a new one that could give the coun something that was beyond the power of even the most enlig ened conservatism to give.

Some concern was expressed by the 1922 committee over t power possessed by the chief whip, Captain David Margess and his assistants, and in October the prime minister receive deputation from it. This expressed the view that the chief w had become more of a buffer than a channel between the pa rank and file and the cabinet, and urged closer co-operatio Mr. Churchill, while in no way modifying his confidence in Ca tain Margesson, conceded the need of a closer liaison.

The earl of Clanwilliam, chairman of the Carlton club, was April elected chairman of the Association of Conservative Cl in succession to the late Lord Bayford.

Contests: *see* Advertising: *Contests;* Radio, Industrial A pects of.

Contract Bridge.

It was expected that 1940 was to be very active year in contract bridge, b the spread of the war, quiescent in early 1940, prevented th The drafting of the new code of laws, work on which had start late in 1939, came to a standstill. The Portland club of Lond the Commission Française du Bridge of Paris and the Whist cl of New York, under whose supervision the laws are promulgat were in communication with each other for months regarding t new code. But when the war engaged the full attention of t French and the British, negotiations ceased, and Harold S. Va derbilt, chairman of the Whist club committee, announced th nothing further would be done until such time as the forei

committees would be able to co-operate.

This decision met with popular favour with the U.S. bridge players for two reasons: (1) it gave them another year, at least, of the old rules without the trouble of learning the new laws and adapting their games to them; and (2), being in full sympathy with their British and French brother players, they felt it only fair that the latter two groups be consulted before bringing out a new code. The committee announced no future date for the new laws; all it promised was that, as soon as Great Britain and France were able to start negotiating again, the three bodies would get together.

Contract bridge did its part, early in 1940, for the beleaguered nations. Huge bridge parties were held all over the United States to aid Britain, France and Finland. More than 30 ambulances were purchased and equipped in this manner and all surplus funds were used to relieve the suffering of the inhabitants in devastated areas.

The year 1940 brought out nothing new in respect to bidding systems. The Culbertson system, used by over 90% of the estimated 15,000,000 U.S. followers of the game, remained virtually the same. However, a new Culbertson system was promised the bridge players for the spring of 1941. Ely Culbertson was working on the new system and released a few of the contemplated changes.

The first change involves lowering the requirements for an opening bid. Mr. Culbertson believes that too many hands are passed out which should be opened. Many partial scores are missed due to the present high requirements for opening bids; by lowering the requirements a bit, he believes a more flexible group of bids can be introduced.

Another contemplated change is the definition of a biddable suit. At the present time the minimum requirement for a four-card biddable suit is Q-J-x-x (the x's denoting cards smaller than the ten). By scaling this down to Q-x-x-x or possibly J-10-x-x, Mr. Culbertson believes that opening bids will become easier to select, and more flexible in connection with the subsequent bidding. Naturally, if the requirements for a biddable suit are reduced, it will be necessary to raise the values for trump support of a once-bid suit. This will foster more one-over-one bidding, and, as a result, additional information will be exchanged between partners.

The American Contract Bridge league (1937 amalgamation of the American Bridge league and the United States Bridge association) reported larger attendance than ever before at its tournaments. A new high was reached in its two blue-ribbon events when 64 pairs of master players competed in the World Championship Master Pair event at Asbury Park, N.J., in August 1940, and 128 pairs competed for the National Pair championship at the winter tournament in Philadelphia, Pa. Over 300 sectional state and city championships were held throughout the United States, at which master points were awarded. The league in 1940 had 12,000 members, of which 3,000 were on the national master point list. Once again, the league's annual charity card party was held all over the country on St. Valentine's Day, and the proceeds were used for crippled and undernourished children. Upwards of $30,000 was realized.

Tournament bridge laws, which come under the jurisdiction of the National Laws commission, were in the process of revision and the new code was promised for the summer of 1941. Many of the laws were undergoing minor changes, which should not affect tournament play. In the scoring, however, there was one major change contemplated which would affect the bidding habits of tournament players: there is a 50 point bonus for bidding and making a partial score, undoubled or doubled; under the new law, if a partial is doubled and the total is less than 100, the bonus will be 100 instead of 50. If redoubled (a club or a diamond), the bonus will be 200. There was much dissension among the players as to the desirability of this change. The group against it contended that it would curtail "close" doubles and thus eliminate one of the exciting features of the game. The favouring group maintained that when the bonus for making a doubled contract was taken out of contract bridge, the game lost one of its most desirable elements.

The death list of 1940 included three well-known figures in the world of bridge. They were Mrs. Emory F. Clement, championship player; Walter F. Wyman, sportsman, lecturer and bridge writer; Cloyd F. Waltman, one of the first-string tournament directors of the American Contract Bridge league. (E. Cul.)

Cook, Frederick Albert (1865–1940), U.S. explorer, was born in Callicoon Depot, N.Y., June 10. He was graduated from the medical school of New York university in 1890 and was the surgeon of the Peary Arctic expedition in 1891–92 and of the Belgian Antarctic expedition in 1897–99. On Sept. 1, 1909, he reported to the Royal Observatory at Brussels that he had reached the north pole and had discovered "land far north" on April 21, 1908. He was welcomed with enthusiasm when he arrived at Copenhagen, but his account of his discovery did not satisfy all the experts. On Sept. 6, 1909, Commander Robert E. Peary reported from Indian Harbour, Labrador, that he had discovered the pole on April 6, 1909. Dr. Cook's evidence of his priority of discovery was submitted to the University of Copenhagen, which failed to find it satisfactory and Dr. Cook did not appear to challenge that decision. He then left the country and sank into obscurity. In 1923 he was convicted on a charge of using the mails to defraud and was sentenced to prison. He served five years of his term, was paroled in 1930 and pardoned by Pres. Roosevelt May 17, 1940. He died after a long illness in New Rochelle, N.Y., Aug. 5.

Coolidge, Dane (1873–1940), U.S. naturalist and novelist, was born in Natick, Mass., March 24, was graduated from Stanford university in 1898 and spent the next year in study at Harvard. While in college he spent his vacations as a field collector for Stanford, the British museum and the United States Biological survey. In 1900 he was a field collector of mammals in France and Italy for the United States Natural History museum. He published his first novel in 1910 and continued to write until his death. He died in San Francisco, Aug. 8.

Cooper, Courtney Ryley (1886–1940), U.S. author, was born in Kansas City, Mo., Oct. 31. He ran away from school at the age of 16 to become a circus clown. He began to write for newspapers in 1910 and a few years later wrote tales of the circus for magazines. He wrote more than 500 such stories and was the author of more than a score of books of adventure. He died in New York city, Sept. 29.

Co-operatives: *see* Farmers' Co-operatives; Marketing.

Copper. World production of copper in 1939 increased by 9% over 1938, to 2,161,500 metric tons, of which the United States produced 666,800 tons (31%) and the British empire 580,000 tons (27%). The United States output increased by 32%, and the Mexican by 18%, but other producers had either losses or increases below the average.

Smelter production in the United States in 1940 was estimated at 823,000 metric tons, an increase of 27% over 1939. The refinery output, which included recoveries from scrap, was 900,000 tons, up 19% from 1939. Deliveries to consumers at 953,000 tons were

World Production of Copper
(In thousands of metric tons)

	1929	1932	1937	1938	1939
Belgian Congo	135.5	54.0	150.6	124.0	121.5
Canada	109.9	113.7	238.1	263.3	281.5
Chile	316.8	103.2	412.9	351.4	339.2
Japan	75.5	71.9	75.9	77.0	77.0
Mexico	78.7	34.1	46.8	41.4	48.8
Peru	54.4	21.4	35.7	37.5	35.4
Rhodesia	5.9	73.0	212.7	215.3	216.0
U. S. S. R.	25.8	30.7	92.5	98.0	107.0
United States	931.1	231.8	757.4	505.0	666.8
World Total	1,921.6	905.5	2,271.6	1,984.1	2,161.5
Ex. U. S.	990.5	673.7	1,514.2	1,479.1	1,494.7

6% above output, and 11% above deliveries during 1939. During the first half of the year sales lagged behind production, and stocks increased 35%, but this was more than offset in the second half, the year ending with stocks 10% less than at the beginning.

The total copper imports into the United States in the first 11 months of 1940 were 678,118,000lb., of which 532,890,000lb. were for processing and export, and 145,228,000lb. were for domestic consumption; this compares with 463,018,000lb., 431,639,000lb. and 31,380,000lb. respectively for the whole of 1939. Exports of crude and semifinished copper, including bare wire but not insulated wire, were 776,637,000lb. in the first 11 months, against 840,307,000lb. in the whole of 1939.

Chilean production during the first three quarters of 1940 was 13% ahead of the same period in 1939. During the first quarter Rhodesia was 14% ahead of the 1939 average, rising to 37% in May. The total for the first seven months in Mexico was 20% behind the same period of 1939. Later figures for these producers did not appear, and for others no information was at hand, practically all of them having discontinued the publication of statistics for the duration of the war.

There was little improvement in the German copper position through its conquests in 1940, for while about 170,000 tons of additional smelting capacity was acquired in Belgium, France and Norway, this was largely dependent on imported ores, so that the only relief to the German shortage was that derived from such stocks of ore and metal that were on hand at the time of seizure. (*See* also METALLURGY; MINERAL AND METAL PRICES AND PRODUCTION; STRATEGIC MINERAL SUPPLIES.) (G. A. RO.)

Copra: *see* COCO-NUTS.

Copyright. During the year 1940 the copyright law of the United States (Act of March 4, 1909) was amended in various important respects. By Public act No. 434, approved March 15, 1940, the words "when such contribution has been separately registered" were deleted from section 23 of the Copyright act. The effect of this amendment is to permit renewals by authors or their widows, children, executors, etc., of works originally published as contributions to periodicals or other composite works.

Other bills for general revision of the copyright law were introduced in congress in 1941. Thus far, however, the conflict of interests involved and the exigency of other matters have succeeded in postponing the adoption of an entirely new law and confined the changes to amendment of the existing statute.

With the transfer of jurisdiction over prints and labels from the commissioner of patents to the register of copyrights on July 1, 1940, by the act of July 31, 1939, the copyright office has in its charge all copyright business. During the fiscal year ending June 30, 1940, 176,997 registrations of claims of copyright were made in the copyright office. The total fees received amounted to $304,005.00.

The copyright law in force requires, as one of the conditio precedent to the registration of a claim of copyright in any wor the deposit of two copies of U.S. books and one copy of forei books. The purpose of this provision is to secure copies of the be edition of a work for the enrichment of the library of Congres The number of books and other articles deposited in connecti with registrations made during the fiscal year amounted 272,041, of which number 171,738 were transferred to the libra of Congress. These included 77,814 books, 69,579 periodical nu bers, 19,759 pieces of music, 3,053 maps and 1,533 photograp and engravings. (C. L. B.)

Cordier, Constant (1880–1940), retired U.S. army office was born in New Orleans, La., May 3 He was educated at Harvard and the University of Lima, Per He served as an officer in the regular United States army fro 1900 to 1919, during which time he was engaged in organizatio and administration and missions abroad. He advised Peru in i boundary dispute with Bolivia and Ecuador and was for a tim political adviser to the U.S. legation at Quito, Ecuador. Congre thanked him for his diplomatic work in South America. Durin the World War of 1914–18 he assisted in the organization of t American expeditionary force and was then liaison officer for t war department and the foreign missions in Washington. He r ceived the Distinguished Service medal. France made him a men ber of the Legion of Honour and he was decorated by Great Bri ain, Japan, China and Italy. He died in Mineola, N.Y., Feb. 2

Corn (MAIZE). The United States corn crop of 1940 was est mated by the department of agriculture Dec. 1 as 2,449 200,000bu., about 6% less than the 1939 crop of 2,602,133 000bu., and 10% over the ten-year (1929–38) average of 2,299 342,000bu. Stocks of old corn on farms Oct. 1 were 555,135 000bu., a supply that has been exceeded but once on that dat 555,596,000bu. Oct. 1, 1939. The ten-year (1929–38) averag carry-over Oct. 1 was 193,967,000bu. It was estimated that 43 000,000bu. of the 1940 crop were sealed under government loan Oct. 1. On the same date in 1939 corn sealed under federal loan was 254,000,000bu. to which 301,000,000bu. of the 1939 crop we subsequently added. Government loans in 1939 were at 57 cen per bu. Owing to higher prices for corn in 1940 the amou advanced by the government was raised to 61 cents per bu.

The yield per acre in 1940 was 28.3bu. compared to 29.4bu. pe acre in 1939 and a ten-year average of 23.2bu. In the 12 state constituting the corn belt 25,000,000 of the 49,544,000ac. plante to corn in 1940 were in the new, higher-yielding, drought-resistan hybrid varieties, the Federal Agricultural Marketing service re

Corn Production by States in 1940 and 1939

State	1940 bu.	1939 bu.	State	1940 bu.	1939 bu.
Iowa	460,581,000	494,312,000	Louisiana	24,128,000	23,325,000
Illinois	332,244,000	413,296,000	New York	21,452,000	24,465,000
Minnesota	172,457,000	204,796,000	Maryland	17,535,000	18,216,000
Indiana	145,669,000	213,416,000	West Virginia	12,852,000	13,994,000
Ohio	120,750,000	171,250,000	Colorado	10,656,000	8,043,000
Missouri	119,280,000	120,118,000	Florida	9,031,000	6,038,000
Nebraska	106,913,000	82,032,000	New Jersey	7,371,000	7,182,000
Wisconsin	93,582,000	85,970,000	Delaware	3,948,000	4,176,000
Texas	90,324,000	73,376,000	Vermont	2,627,000	3,040,000
Kentucky	70,400,000	70,400,000	Montana	2,544,000	1,768,000
Tennessee	69,175,000	52,700,000	New Mexico	2,376,000	2,552,000
Pennsylvania	53,640,000	58,140,000	California	2,240,000	2,040,000
Michigan	49,856,000	58,830,000	Connecticut	1,960,000	1,950,000
South Dakota	50,112,000	46,848,000	Wyoming	1,930,000	1,771,000
Georgia	46,849,000	36,941,000	Oregon	1,860,000	2,04 ,000
North Carolina	44,733,000	47,619,000	Massachusetts	1,558,000	1,520,000
Alabama	43,450,000	34,080,000	Idaho	1,292,000	1,138,000
Arkansas	42,903,000	32,318,000	Washington	1,146,000	1,104,000
Kansas	41,028,000	37,220,000	Utah	616,000	475,000
Mississippi	40,544,000	35,488,000	New Hampshire	600,000	615,000
Oklahoma	40,356,000	27,216,000	Maine	507,000	546,000
Virginia	36,490,000	36,530,000	Rhode Island	369,000	410,000
North Dakota	24,480,000	16,995,000	Arizona	362,000	275,000
South Carolina	24,304,000	25,433,000	Nevada	120,000	120,000

(*See* also CEREALS.)

ported. The marketing service's survey reported that 88% of the 1940 Iowa corn crop was in hybrid varieties; in Illinois 77%, Indiana 66%, Ohio 57%, Minnesota 54%, Wisconsin 51%, Missouri 28%, Nebraska 23%, Michigan 17%, South Dakota 12%, Kansas 8%, North Dakota 3%.

Reports of foreign production of corn were fragmentary because of wartime restrictions on agricultural statistics. The corn crop harvested in Argentina in 1940 (1939–40 crop year) was reported as 408,442,000bu. compared to 191,485,000bu. in 1939. In a decree of Aug. 14, 1940, the Argentine government offered 36 cents a bushel to growers for corn for export up to Nov. 30. The South African crop harvested in 1940 was estimated at 72,277,000bu. of which 8,534,000bu. were grown by natives. The 1940 crop in Hungary was reported as 116,686,000bu. compared with 91,906,000bu. in 1939. (S. O. R.)

Cornell University. A non-sectarian, co-educational institution in Ithaca, N.Y., founded in 1865 and incorporated as a land-grant college under the Morrill act of 1862. The university comprises the endowed schools and colleges of arts and sciences, engineering, architecture, law and medicine (located in New York and operated in conjunction with the New York hospital), and the state-supported colleges of agriculture, home economics and veterinary medicine. Two experiment stations, at Geneva and Farmingdale, are operated in connection with the college of agriculture. Degrees for advanced study other than professional are awarded through a graduate school. During the academic year 1939–40, there were 7,174 students, of whom 1,552 were women. The faculty, which had 1,689 members, included 52 emeritus professors, 310 professors, 38 associate professors, 265 assistant professors, 32 lecturers and associates, 443 instructors and 549 assistants. A significant appointment during the year was that of Dr. Peter Debye, former George Fisher Baker non-resident lecturer in chemistry, as professor of chemistry and chairman of the department of chemistry. Productive funds on June 30, 1940, amounted to $31,015,017. Land and buildings were valued at $19,654,425 and equipment at $8,402,189. The library contained 1,071,844 volumes. President, Edmund Ezra Day, Ph.D., LL.D. (E. E. D.)

Corporation Income Tax: *see* INCOME TAX.

Cortelyou, George Bruce (1862–1940), U.S. statesman and industrialist, was born in New York city, July 26, and was graduated from the Georgetown university law school in 1895. He was stenographer and executive clerk under President Cleveland and secretary to Presidents McKinley and Theodore Roosevelt. In 1903 President Roosevelt appointed him to the cabinet as secretary of commerce and labour. Later he was postmaster general and secretary of the treasury.

He was chairman of the Republican National committee from 1904 to 1907. On his retirement from the cabinet in 1909 he was elected president of the Consolidated Gas Company of New York, a position he held until his retirement in 1935. He died at Huntington Bay, N.Y., Oct. 23.

Corundum. The United States has no production of corundum, the natural oxide of aluminium, and depends entirely on imports, which vary from 2,000 to 4,000 long tons annually, mainly from South Africa. Extensive deposits are known in the Zoutpansberg, Pietersburg, and Leydsdorp district of Northern Transvaal and these now furnish the bulk of the world supply; the 1939 sales were 2,620 short tons, increasing to 2,039 tons in the first half of 1940. (G. A. Ro.)

Cosmetics: *see* SOAP, PERFUMERY AND COSMETICS.

Cosmic Rays: *see* MATTER, STRUCTURE OF; PHYSICS.

Costa Rica, a Central American republic; language, Spanish; capital, San José (pop. 66,800); president, Rafael Angel Calderón Guardia; area, 23,000 sq.mi. The population is 639,197 (Dec. 31, 1939 official estimate).

On Feb. 11, 1940, Rafael Angel Calderón Guardia was elected president to succeed Dr. León Cortés, and assumed office on May 10. Under Pres. Calderón Guardia, Costa Rica continued to maintain exceedingly cordial relations with the United States and to co-operate closely with western hemisphere defence measures. Popular support of the government's foreign policy was indicated in June by strong demonstrations of protest against Italian entry into the European war. A vigorous stand was taken against "fifth column" agitation, and the government summarily rejected the German minister's efforts to dissuade Costa Rica and other Central American states from participation in the Havana conference.

Economically, Costa Rica was hard hit by European war conditions, especially through loss of European markets for her coffee, but continued banana development in the Parrita-Quepos region, involving an annual influx of over $3,000,000 new capital, helped to modify the economic crisis. The new plantations were declared to be the most scientifically prepared in the world. The precarious state of the coffee industry, Costa Rica's economic mainstay, was somewhat improved by the Inter-American Coffee Quota agreement of Nov. 1940, which allotted Costa Rica 200,000 bags (60-kg. each) for export to the United States against 104,036 bags in 1936.

Most significant of all the year's events was beginning of work on the 360-mi. section of the Pan American highway from San José to the Panama border under supervision of United States Public Roads administration experts. The project, financed by a $4,600,000 United States Export and Import bank credit, was regarded as a valuable offset to unemployment, as well as an eventually important factor in the national communications system. Costa Rica has extensive external communication by sea and by Pan American Airways. Several domestic air lines, 450mi. of railway, and an 1,800mi. highway system provide internal communication.

In 1939, imports (chiefly foodstuffs and manufactured goods) totalled $16,884,962 (United States, 58·8%; Germany, 17·7%), including $3,873,475 for banana development; exports were $9,086,498 (United States, 45·6%; Germany, 25·1%; Great Britain, 16·9%). Coffee (51·1%), bananas (21%) and cacao (8·2%) are the most important exports.

Costa Rica, cultural centre of Central America, has 671 public schools (64,594 pupils). A national university was established in Aug. 1940. The monetary unit is the colon (value: 17¾ cents U.S.). (L. W. BE.; L. C. DE A.)

Cost of Living. The upward trend of the cost of living characteristic of almost the entire world after 1933 continued into 1937–38, but only in France and Norway (excluding war areas) did 1937–38 indexes of food prices go higher than in 1929. In most nations 1937–38 food prices were higher than 1936 and higher again in 1939. The outbreak of the European war was stimulating the upward movement of prices during the last half of 1939. Great Britain, Finland, Belgium, Norway and Switzerland experienced almost a 10% increase in food prices in 1937–38 but during the first half of 1938 cost of living stabilized at approximately the 1937 levels in most of the nations. In 1939 there was a slight increase during the early part of the year and a more substantial upward movement during the late summer and fall. Early 1940 figures showed slight increases.

Indexes of Cost of Living for Specified Periods for the United States and Certain Foreign Countries

(Series recalculated by International Labour Office on base 1929=100; a=food; b=heating and lighting; c=clothing; d=rent; e=miscellaneous)*

Country	Australia	Canada	France		Germany	Gr. Brit. & N. Ireland	Italy	New Zealand	Norway	Sweden	So. Africa	U.S.
Towns and localities	30	60	Paris	45	72	509	50	4–25	31	49	9	32–51
Original base=100	1923–27	1926	1914	1930	1913–1914	July 1914	June 1928	1926–1930	July 1914	July 1914	1914	1923–25
Composition of index	a–e	a–e	a–e	a–e	a–e	a–e	a–e	a–e	a–e	a–e	a–e	a–e
1929	100	100	100	..	100	100	100	100	100	100	100	100
1933	78	78	94	87	77	85	80	79	89	91	88	76
1937 March	84	82	100	97	81	92	87	90	97	95	90	84
Sept.	85	84	113	104	81	96	95	93	102	97	91	85
1938 March	86	84	124	113	81	94	98	94	103	97	94	83
Sept.	88	84	124	117	81	95	97	95	102	98	93	83
1939 March	89	83		122	82	93	99	96	102	99	94	82
June	90	83	.	123	82	95	102	98	104	99	94	83
Sept.	89	85	.		82	101	.	99	104	101	93	83
Dec.	89	89			82	106	..	101	110	105	94	82·2
1940 March	90	86	.		84	109	.	..	117	109	96	.
May	..	86	..	..	85	110	..	..	..	..	97	..

*Table from *International Labour Review*, July 1938 (p. 140), Oct. 1939 (p. 567) and July 1940 (p.78). Quarterly averages for 1937 computed in February, May, August and November. Australian and French figures are for February, May, August and November instead of months listed in the table.

The cost of living reached a very high level in Great Britain early in 1940. In January alone, food costs rose 2½% in spite of the efforts of the government, which was spending £1,000,000 a week in pegging down the prices of such staples as bread, flour, meat and milk. The indexes for Norway and Sweden also revealed extremely rapid upward movement of the cost of living in early 1940. In Germany, government control of prices explains the relatively small increase. For Italy, figures were not available. The United States cost of living rose less than 5% during the first year of the war which began in 1939.

The accompanying table shows the relative trends of cost of living in 11 countries from 1929 through May 1940. The figures have been recalculated by the International Labour office on a 1929 base and this table cannot be compared directly with the table published for 1937 and previous years. (*See* also FINANCIAL REVIEW; PRICES; WEALTH AND INCOME, DISTRIBUTION OF.)

BIBLIOGRAPHY.—Readers interested in additional information are referred to current issues of the *Monthly Labor Review* (U.S. bureau of labour statistics), the *Ministry of Labour Gazette* (British ministry of labour), and *The Labour Gazette* (department of labour, Canada). *Cf.* also *International Labour Review*. (D. D. L.)

Cotton. World production of cotton in the 1940–41 crop year was estimated by the office of foreign agricultural relations, U.S. department of agriculture, as 30,500,000 bales of 478lb. net to the bale. Production in 1939–40 was placed at 28,900,000 bales; 29,200,000 bales in 1938–39. Owing to the absence of official reports in a number of countries, because of the war, the office of foreign agricultural relations placed its production estimates in three divisions: (1) estimates based on official reports or other credible information; (2) estimates based on acreage, reported growing conditions and crop records; (3) estimates based on production in recent years. These estimates on production in bales of 478lb. net are shown in Table I.

Production of cotton in the United States in 1940 (1940–41 crop year) was estimated by the department of agriculture at 12,686,000 bales of 500lb. gross, as of Dec. 1. Production in 1939 (1939–40 crop year) was 11,817,000 bales, and in the ten-year (1929–38) average, 13,547,000 bales. Yield of lint cotton in 1940 was 252·4lb. per acre. In 1939 it was 237·9lb. per acre. The ten-year average was 198·1lb. per acre. The area harvested in 1940 was estimated at 24,078,000ac. compared with 23,805,000 ac. in 1939. Estimated production by states is shown in Table II.

Consumption of cotton in the United States during the crop year ending July 31, 1940, was 7,745,574 bales. Domestic consumption during the year Aug. 1, 1940, to July 31, 1941, is expected to run more than 8,000,000 bales, the highest on recor Activity of cotton mills in t United States increased great during 1940. Cotton ginnin Aug. 1, 1939, to July 31, 194 were 11,376,233 bales. Stoc of cotton on hand in the Unit States at the end of the cr year July 31, 1940, totalled 10 595,720 bales compared wi 13,032,513 bales July 31, 193 Data on world supplies a fragmentary because wartin regulations prohibit giving o cotton statistics in a number European countries. Up to Oc 1 the Federal Commodi Credit corporation report loans of $40,908,466 on 84 439 bales of the 1940 crop. Of this amount $5,699,597 was a vanced on 117,595 bales by co-operatives. Trade reports anti pated that probably 4,500,000 bales of the 1940 crop would stored under loans. The national marketing quota of cotton 1940 was 12,000,000 bales, the same as in 1938 and 1939, a the same as proposed for 1941.

World trade in cotton during the year ending July 31, 194 was substantially higher than the preceding year and only 9 below the average. Outstanding in the world movements of cott during the year was the increase of United States shipments to t

Table I.—Estimated World Production of Cotton, 1940–41, 1939–40

	1940–41 bales	1939–40 bales		1940–41 bales	1939–40 bales
1. Estimates Based on Official Reports or Other Credible Information					
United States	12,686,000	11,817,000	Belgian Congo	180,000	161,000
U. S. S. R.	4,300,000	4,050,000	Burma	92,000	82,000
China	2,200,000	1,883,000	French Equatorial Africa	83,000	39,000
Northern Brazil	716,000	630,000	Greece	80,000	74,000
Turkey	360,000	300,000	Bulgaria	46,000	48,000
Mexico	258,000	310,000	Mozambique	37,000	40,000
Iran	230,000	184,000	Syria and Lebanon	30,000	32,000
Chosen	189,000	189,000			
2. Estimates Based on Acreage, Growing Conditions and Crop Records					
India	4,200,000	4,136,000	Uganda	289,000	289,000
Egypt	1,850,000	1,801,000	Paraguay	40,000	26,000
Southern Brazil	1,500,000	1,367,000	Iraq	15,000	13,000
Argentina	325,000	342,000			
3. Estimates Based on Production in Recent Years					
Peru	350,000	414,000	Australia	13,000	13,000
Anglo-Egyptian Sudan	250,000	245,000	Venezuela	12,000	12,000
Tanganyika	50,000	65,000	Rumania	11,000	11,000
Italy	44,000	44,000	Nyasaland	10,000	10,000
Nigeria	40,000	40,000	Ecuador	9,000	9,000
Colombia	30,000	30,000	Salvador	6,000	6,000
Haiti	20,000	14,000	British West Indies	6,000	6,000
French West Africa	17,000	17,000	Yugoslavia	6,000	6,000
Kenya	15,000	15,000	Thailand (Siam)	5,000	5,000
Angola	14,000	14,000	Total Foreign*	17,759,000	17,083,000
Spain	14,000	14,000			

*Total foreign production includes "30 to 40 minor countries" that produce 50,000 75,000 bales of cotton annually.

Table II.—Estimated Cotton Production by States, 1940 and 1939

State	1940 bales	1939 bales	State	1940 bales	1939 bales
Texas	3,285,000	2,846,000	Tennessee	515,000	449,000
Arkansas	1,540,000	1,413,000	Louisiana	455,000	745,000
Mississippi	1,280,000	1,582,000	Missouri	380,000	437,000
Georgia	1,020,000	915,000	Arizona	195,000	202,000
South Carolina	970,000	871,000	New Mexico	123,000	102,000
Oklahoma	805,000	526,000	Virginia	25,000	13,000
Alabama	790,000	785,000	Florida	20,000	11,000
North Carolina	740,000	457,000	All other states	18,000	20,000
California	525,000	443,000			

Table III.—*Cotton Exports of the United States, 1940 and 1939*

Country	1940 bales	1939 bales	Country	1940 bales	1939 bales
United Kingdom	2,007,000	421,000	Canada	432,000	238,000
Japan	941,000	896,000	China	422,000	87,000
France	773,000	362,000	Germany*	20,000	345,000
Italy	577,000	292,000			

*Includes shipments to free port of Bremen.

United Kingdom, United States cotton being 31% of the imports by the United Kingdom, while Japanese imports of United States cotton were 28% below the ten-year average. United States shipments to the United Kingdom were the highest of any year since 1927.

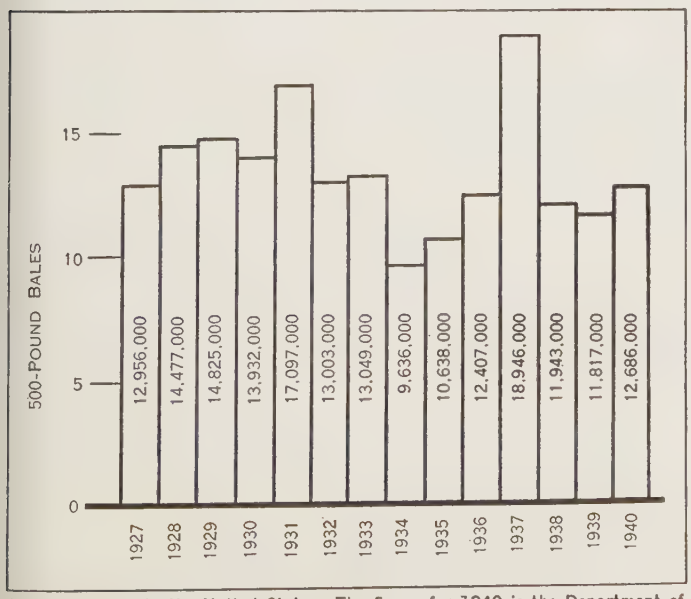
The principal cotton exports of the United States in the year ending July 31, 1940, and in the preceding 12 months were as shown in Table III.

The heavy increase in United States exports was attributed to three factors. One was the depleted foreign stocks of United States cotton. Another was the federal government's aid in exports. The third was the fear that shipping losses in the war would curtail shipments subsequently. Japan, which is one of the largest exporters of cotton goods, consumed 2,419,000 bales of cotton during the year ending June 30, 1940, compared with 2,516,000 bales in 1939. Much of Japan's market for cotton goods has been reduced, while its stocks have accumulated. As a result of smaller imports of cotton by Japan and a shift to Brazil as a source of supply the U.S. department of agriculture reported that Japan would probably take not more than 500,000 bales of U.S. cotton in 1940–41. The Japanese eight-year plan to increase cotton production in northern China from less than 500,000 bales to 3,000,000 bales annually made no "notable progress" in 1940 because of lack of funds, U.S. agricultural advices reported. Japan bought the entire 1940 cotton crop of Iraq. The British government took over the Egyptian crop and established a fixed price to growers. Effective Oct. 1, 1940, the British government announced a maximum price for American and Egyptian cotton based on Liverpool price levels as of Sept. 24. The same order provided that utilization of all nonempire cotton would be under licence.

Cotton pledged on U.S. government loans, from the 1940 crop, totalled about 2,553,000 bales through Dec. 19, 1940, bringing the total stocks of government-financed cotton to about 10,800,000 bales. (S. O. R.)

Cotton Manufacture.—The national defence program was by far the greatest influence in the United States cotton manufacturing industry in 1940. Although it can be shown statistically that government purchases added a relatively small percentage to the total quantity of cotton consumed during the year, there were indirect effects of far greater significance. In the first place, the defence program boosted the level of general industrial activity throughout the country and in practically all divisions of U.S. economy, with the result that the level of purchasing power was likewise raised. This, in turn, had its effect on textiles, just as such moves always influence a consumer-goods industry. In the second place, the pressure of army purchases upon certain groups of cotton textiles, in which a scarcity or potential scarcity existed, had an effect far beyond the poundage or yardage of the bids involved.

PLOWING a New Mexico cotton field in the spring of 1940



COTTON CROP in the United States. The figure for 1940 is the Department of Agriculture's December estimate

Some idea of the extent of the government operations can be gained from the list of partial purchases of cotton products by the quartermaster corps of the army between June 30 and Dec. 1, 1940.

Cloth, cotton herringbone twill, yd.	4,600,000
Cloth, cotton khaki, 8.2 oz., yd.	36,919,000
Coats, working, denim, yd.	2,874,000
Drawers, cotton, short, yd.	5,155,000
Duck tentage, cotton, o.d. light, yd.	3,450,000
Duck tentage, medium, yd.	6,547,000
Duck tentage, heavy, yd.	19,396,000
Handkerchiefs	5,005,000
Shirts, cotton khaki	926,000
Sheets	7,380,000
Socks, cotton, pr.	14,000,000
Towels, hand, huck	5,200,000
Towels, bath	1,500,000
Trousers, cotton khaki	1,300,000
Trousers, work, denim	2,800,000
Undershirts, summer	4,200,000

The principal bottlenecks in cotton textiles, so far as the defence program was concerned, were in heavy cotton goods, because of the tremendous demand for duck, and in combed yarn cotton goods, because of the specification of a combed yarn fabric by the army for shorts and for cotton khaki uniforms. At times, offerings on invitations to bid were below the specified quantities, and it was necessary to modify specifications to draw out sufficient bids.

The Fall Boom.—Due to both the direct and indirect influences of the defence program, as noted above, the fall of 1940 was the most active one in cotton manufacture in the history of the industry. The calendar year 1940 as a whole closed with a domestic consumption of approximately 8,000,000 bales, a new high. This was approximately 8% greater than the consumption of the previous year which had been a record. Since, as just mentioned, the height of the activity was reached in the fall of 1940, and since it was still going strong at the start of 1941, there are predictions of a total domestic consumption of 8,500,000 bales or even 8,750,000 bales for the crop year which ends July 31, 1941. Brilliant as this statistical picture may seem, the thoughtful student sees in it no assurance of a permanent solution of the cotton problem. Consumption has not increased as the result of a broad awakening of cotton consciousness, but rather because of a combination of national and international developments which acted as artificial stimuli. The reaction from them will eventually take place and there will be the same problem of a burdensome cotton surplus and continued inroads from competitive fibres, particularly the synthetics.

The Synthetics.—On the matter of synthetic competition, there is no question that the defence demands delayed the march into the territory of cotton. There was immediately a considerable demand for cloths made of cotton. Nevertheless, there is no reason to believe that the advance of synthetics at the expense of cotton has been halted at all permanently. The advantage was in 1940 still definitely with the man-made fibre, because of its controllability both as to characteristics and quantity. The possibility of a completely synthetic industry some time in the future could not be discarded as a crazy notion.

That, of course, is from the standpoint of the supply, which threatened cotton agriculture more than it did the cotton industry. In fact, some of the developments in connection with synthetic fibres held promise of an increase rather than a decrease in the function of the cotton mill. Cotton manufacturers were turning more and more to equipment designed specifically for handling of spun rayon—either alone or blended with wool fibres—and were producing from such yarns outerwear fabrics for men's and women's summer wear which previously had been made in woollen and worsted mills. The advantage the cotton mill has in this respect is, generally speaking, greater speed of production.

The tendency toward ever-increasing speeds of operation was further evidenced by such developments as extension of the installations of long-draft roving, and the perfection of automatic winding. The cotton mill is constantly becoming more and more completely automatic.

Wage-Hour Legislation.—The operation of the wage-hour law, which was cotton-textile issue No. 1 in 1939 up to the outbreak of the war in Europe, was relegated to a position of almost negligible importance in 1940, principally because of the dominance of the needs of the defence program. The minimum wage of 32½ cents adopted by an industry committee and made effective Oct. 24, 1939, was still in force. Constitutionality of the wage-hour law had been attacked by a group of southern cotton mills and the decision on their suit was pending before the United States supreme court at the close of 1940.

In other respects, also, the field of employer-employee relations in the cotton textile industry was quiet. Strikes were few in number and the main problem was one of securing an ample supply of help, particularly in the more skilled classifications, to meet the needs of the defence program. The tendency toward sale of mill houses by the company to employees in the southern industry continued but did not yet develop into a major trend.

Anti-Trust Action.—A case which held in its implications the question of what an over-competitive industry such as cotton textiles can do to put its house in order was the suit brought by the federal bureau of investigation against a committee representing the print cloth branch of the cotton textile industry. This committee had undertaken a joint voluntary program, on the part of the members of the industry, toward the reduction of operations in the summer of 1939, prior to the stimulating effect of the war in Europe. The committee had discussed its intent and its method publicly. The case finally came to trial in Greenville, S.C., toward the end of 1940. The defendants entered pleas of *nolo contendere,* thus admitting no violation of the anti-trust statutes, but at the same time preventing delays in the national defence program which would have resulted from prolonged trials. They were given nominal fines of $100 each, and the presiding federal judge stated that the payment was not in any way a penalty but simply intended to meet the technicalities of the law. He stated that if he were sitting on a jury, he would declare the defendants innocent of any violation of the law in the case. It is recognized that the answer to this question of industry-wide co-operation, and its relation to the anti-trust statutes, has still not been given.

Cotton Promotion.—An important step taken by the industry in 1940 was a launching of a still more aggressive cotton promotion program. The Cotton-Textile institute, with the co-operation of other groups, proposed to develop what was called a Cotton Bureau of America, for the purpose of trying to increase domestic cotton consumption to 10,000,000 bales a year. It secured pledges of special assessments of two cents per bale of cotton consumed from more than half of the spindles in the industry and also enlisted the co-operation of all groups engaged in cotton economy from the grower through to the retail distributor. One of the important factors in this movement is the co-operation of some 100,000 retail stores, large and small, chain and independent. (*See* also LINEN AND FLAX; RAYON; TEXTILE INDUSTRY; WOOL; etc.)

(D. G. Wo.)

Cottonseed Oil: *see* VEGETABLE OILS AND ANIMAL FATS.

Countries of the World, Areas and Populations of the: *see* AREAS AND POPULATIONS OF THE COUNTRIES OF THE WORLD.

Craigavon, James Craig, 1ST VISCOUNT (1871–1940), prime minister of Northern Ireland, was born in Craigavon, County Down, Ireland, Jan. 8, and died at Glencraig near Belfast, Nov. 24. For a biographical sketch see *Encyclopædia Britannica,* vol. 6, p. 630.

Cramer, Stuart Warren (1868–1940), U.S. manufacturer, was born in Thomasville, N.C., March 31, and was graduated from the United States Naval academy in 1888. In that year he entered the school of mines of Columbia university. In 1889 he was employed as an assayer in charge of the U.S. assay office in Charlotte, N.C., remaining there until 1893, when he was employed as manager of a mill. From 1895 to 1918, as a mill engineer and contractor, he designed or equipped about one-third of the cotton mills in the south. He served as president or treasurer of several cotton mills. During the World War of 1914–18 he was a member of the production engineering committee of the U.S. council for national defence and served on several other commissions, including President Hoover's commission on relief for the unemployed and the commission on home ownership. He died in Charlotte, N.C., July 2.

Cravath, Paul Drennan (1861–1940), U.S. corporation lawyer, was born in Berlin Heights, Ohio, July 14. He was graduated from Oberlin college in 1882 and from the law school of Columbia university in 1886. He

was first employed by the law firm of which Charles Evans Hughes was a member, and at the same time was a law tutor in the Columbia law school. During the World War of 1914–18 he was counsel to the Col. House commission to the inter-Allied war conference, and in 1918 he was made counsel of the U.S. mission to the inter-Allied council on war purchases and finance. Because of his services with these commissions Gen. Pershing gave him the Distinguished Service medal; he was also made a Chevalier of the French Legion of Honour, a Grand Officer of the Italian Order of the Crown, an honorary bencher of Gray's Inn, London, and an officer of the Crown of Rumania. He died at Locust Valley, L.I., N.Y., July 1.

Crawshaw, William Henry (1861–1940), U.S. educator, was born in Newburgh, N.Y., Nov. 6 and was graduated from Colgate university in 1887. He was then appointed an instructor in English and elocution at Colgate. In 1893 he was made professor of English literature and in 1917 professor of general literature, holding that post until his retirement in 1930. He was dean for 33 years until his retirement, and acting president of the university three times. He was the author of several books, including *The Interpretation of Literature, The Making of English Literature* and *The Indispensable Soul.* He died in Hamilton, N.Y., July 2.

Cricket. The war put the shutters up against county cricket for the summer of 1940. The game was barely kept alive in the first-class sense, the most ambitious effort being that of a miscellaneous side calling themselves the "London Counties" —somewhat of a misnomer as players such as Arthur Wellard of Somerset turned out consistently. This team played week-end matches regularly, mostly one-day events, and were too strong for the majority of their opponents; perhaps the most interesting feature of their play was the return to this class of cricket of Jack Durston, the former fast bowler of Middlesex, who now met with considerable success as a bowler of slow leg-breaks. This one-day cricket demonstrated the adaptability of first-class players to the unaccustomed conditions; 600 runs in a day did not prove beyond the capacity of the competing teams, and players of promise were discovered; but, without any real standard by which to judge, it would be unwise to attach too much importance to their performance.

Many of the county professionals played Saturday afternoon cricket with the Bradford league. In this competition Eddie Paynter, playing for Keighley, and Wilf. Barber, for Brighouse, indulged in a duel for honours. Paynter won, scoring over 1,000 runs and finishing with a final average of 79 per innings, closely followed by Barber, who generally scored at a much faster pace than was usual with him in county games. George Pope, the younger of the two Derbyshire brothers, playing for Lidget Green, getting near the 1,000 runs and having over 100 wickets to his credit, set up all-round figures without parallel in the long history of the Bradford league.

In Australia a normal season's play was gone through, with an unusually exciting finish. When New South Wales and Victoria met in the last match of the season the situation was such that the championship depended upon it. New South Wales were eventually victorious, in what was to all intents and purposes a "final tie" match, despite the fact that Hassett, the Victorian batsman, scored a century in both innings. As further demonstrating the all-round strength of New South Wales—who recovered brilliantly from a bad start—the side met and defeated by two wickets a team made up of the rest of Australia, including Bradman, who was not quite the outstanding success of previous seasons. Stan McCabe, captain of New South Wales, was again their premier batsman, but W. J. O'Reilly, with 52 wickets in Sheffield Shield games, exceeded his previous best in a season in that competition. Valuable assistance was rendered by another spin bowler, Pepper, who is mentioned as a likely successor to Clarence Grimmett, the googly man who, by the way, continued to get many victims.

It was noticeable that the Australian pitches in general, and the one at Sydney in particular, were of the kind to balance much more evenly the struggle between bat and ball, and there was brighter cricket all round. In Cohen, New South Wales had an opening batsman who might succeed some of the famous players who have occupied this role for Australia in the past. Cricket in South Africa was not distinguished either for outstanding performances or general quality of the play; it was restricted, also.

Crime. With the advent of 1940, the *Uniform Crime Reports,* initiated in 1930 as a means for securing comparable data on the volume and distribution of criminal acts, moved into their second decade. As the reporting area was extended, rapid growth of the crime reporting system naturally slackened. As of Jan. 1, 1940, it included 94·1% of all cities and towns in the United States with over 10,000 population, and 98·3% of the total population of all communities of this character. A large number of smaller places and many extensive rural areas were also included. Using such representative sources as an index for the country as a whole, the federal bureau of investigation estimated that a total of 1,484,554 "reportable offences" (comprising the eight selected types of crimes listed below) were committed in the United States during 1939. This represented an increase of 3·6% over a similar estimate for 1938.

Crime in Cities, Towns and Villages.—During the 1930–39 decennium, all classes of reportable offences declined in number, except rape and larceny, which increased perceptibly. These depression years might be expected to increase the number of thefts, many of which were of a petty nature. Aggravated assaults and burglaries, however, showed a rising tendency towards the end of the ten-year period, and this apparent reversal of the trend was extended into 1940. The long, and at times precipitous, decline in auto thefts also came to a temporary halt during 1940. Thus there were surface indications that the urban portions of the United States might be about to experience a new wave of criminal acts, though the extent of the upswing was not significantly large in any of the affected offence categories.

A comparative statement of crime rates for the first nine months of the years 1938, 1939 and 1940 appears in Table I. It is based upon returns from 2,025 cities, towns and villages in 1940, from 1,964 such communities in 1939 and from 1,894 in 1938.

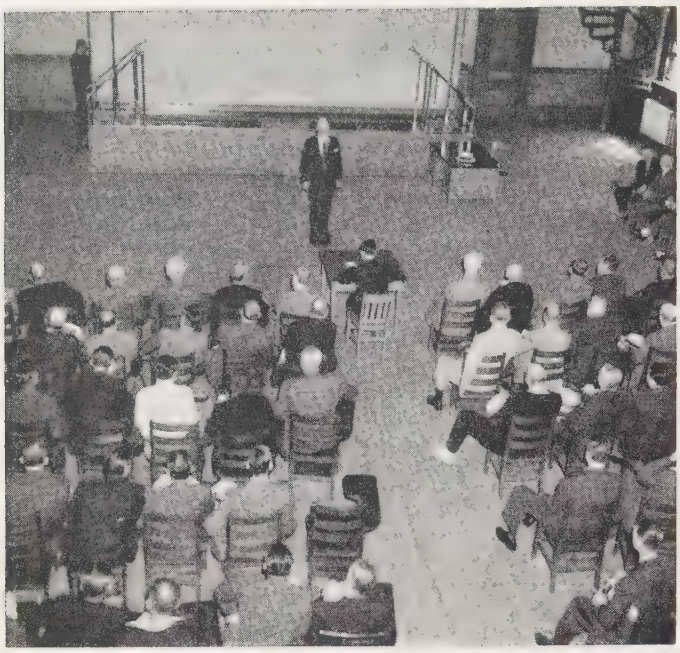
Table I.—*Offences Known to the Police*

January-September, 1938–40 Inclusive; Rates per 100,000 of Population

Offence	1940	1939	1938	Offence	1940	1939	1938
Murder and Non-negligent Manslaughter	4.0	4.0	3.9	Robbery	39.1	40.7	42.4
Manslaughter by Negligence	3.1	2.9	3.1	Aggravated Assault	34.8	34.3	32.8
Rape	6.8	6.8	6.3	Burglary—Breaking or Entering	263.8	259.4	243.0
				Larceny—Theft	690.3	652.1	584.9
				Auto Theft	129.0	128.8	134.8

There were no major changes in the geographic distribution of crime. The south Atlantic, east south central and Pacific states in general had the highest urban rates, with New England and the middle Atlantic region having the lowest. Homicides and assaults reached their highest levels in the south; auto theft and burglary were highest on the west coast.

Crimes tend to be relatively more frequent in the larger cities, with diminishing rates as cities dwindle in size. This general rule again prevailed in 1940, except that Group II cities (with



AFTER THE FATAL BOMBING of July 4, 1940 at the New York World's fair, 675 detectives of New York city attended a special course to prevent repetition of such outrages. In the picture Police Commissioner Lewis J. Valentine is addressing the class

populations from 100,000 to 250,000) dislodged the largest cities from their leading position in 1939. Even this shift, however, was in accordance with rule, because the two groups often thus exchange their relative positions.

The percentage distribution of reportable offences during 1940 showed larceny with 58·9% of the total, burglary 22·5%, auto theft 11%, robbery 3·3%. As compared with 1938 and 1939, these figures showed an increase for larceny, but relative declines for the others. As in 1939, so again in 1940, crimes against the person represented only 4·3% of all reportable offences. In Table II the per capita rate for the several offences, during the first three quarters of 1940, is shown for 2,025 cities, towns and villages, grouped according to size, and with a total population (1933 estimate) of 62,288,351.

Table II.—*Crime Rates per 100,000 Population*
January-September, Inclusive, 1940

	Population Groups of Cities (000 Omitted)						
	I Over 250	II 100–250	III 50–100	IV 25–50	V 10–25	VI under 10	Total
Murder and Non-Negligent Manslaughter	4.0	4.4	3.9	2.9	3.0	3.6	4.0
Manslaughter by Negligence	4.0	3.2	2.7	2.6	1.4	1.8	3.1
Rape	8.6	5.2	4.8	4.9	5.4	6.2	6.8
Robbery	54.2	37.4	29.6	22.9	18.5	17.6	39.1
Aggravated Assault	37.4	41.2	45.4	20.0	23.9	21.2	34.8
Burglary—Breaking or Entering	296.5	305.1	274.0	243.0	196.0	193.3	263.8
Larceny—Theft	760.4	787.5	724.9	719.3	567.0	424.1	690.3
Auto Theft	149.5	151.7	118.5	116.9	83.7	77.2	129.0

The increasing frequency of larceny since 1930 has been marked chiefly by a relative increase in the smaller thefts, as reflected by figures for 1938–40, shown in Table III.

Table III.—*Relative Frequency of Smaller Larcenies*

Value of Property Stolen	Per Cent of Total Larcenies		
	1940	1939	1938
Over $50.00	10.9	11.8	13.0
$5.00 and under $50.00	65.0	64.9	65.0
Under $5.00	24.1	23.3	22.0

Although Table III shows the increasing relative frequency of the smaller larcenies, and a relative decline in the larger losses by theft, this fact should not be allowed to obscure the social significance of the continuing rise in the larceny rate.

Coincident with the rise in the larceny rate was a slight decli in the per cent of stolen property recovered. During the fir three quarters of 1940, only 66·5% was recovered, as compar with 67·2% in the corresponding period of 1939, the latter bei a peak year. A further rise, however, was shown in recoveries stolen cars. In 1940, recovered cars represented 97·8% of tho stolen, as compared with 96·0% in 1939, and 93·5% in both 19 and 1938.

With respect to larcenies in general, thefts from parked mot cars represented by far the largest single type, reaching t impressive figure of 36·5% of all larcenies reported. Bicyc thefts were 15·3% of the total. Police were unable to suggest a new means by which they could better protect from theft the hu dreds of millions in property left unattended on city streets a rural highways.

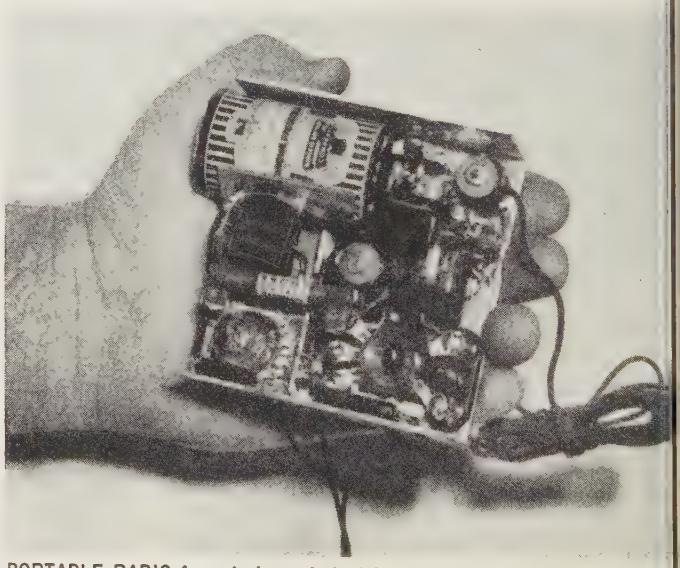
Rural Crime.—The federal bureau of investigation made special statistical study of rural crime rates for 1939 in sev selected states (California, Idaho, Massachusetts, Michigan, Mi nesota, Rhode Island and Washington). It served to confirm t results of earlier fragmentary studies to the effect that while t rural rates for crimes against property quite generally are w below urban levels, the rural rates for homicide, rape and aggr vated assault were quite likely to exceed those of the cities. the states under review, this was particularly true of Californi Idaho and Washington, and was least pronounced in Rhode Islan and Michigan. As to negligent manslaughter (traffic accident and rape, the rural rate exceeded the urban in five of the sev states.

(*See* also FEDERAL BUREAU OF INVESTIGATION; JUVENI DELINQUENCY; POLICE.)

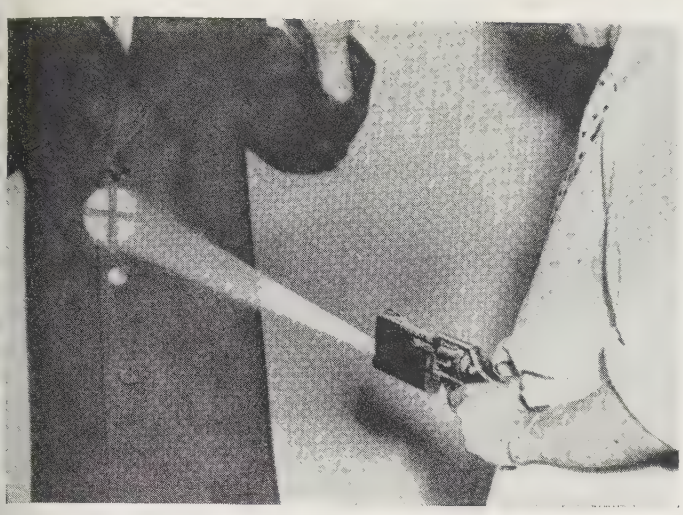
BIBLIOGRAPHY.—*Uniform Crime Reports* (quarterly) for 1939 and f the first three quarters of 1940 (Federal Bureau of Investigation, Was ington); *Prisoners, 1938* (U.S. Bureau of the Census, 1939); *Ten Yea of Uniform Crime Reporting* (Federal Bureau of Investigation, 1940 *Judicial Criminal Statistics, 1938* (U.S. Bureau of the Census, 1940).

(BR. S.)

Great Britain.—Statistics for 1938, the latest year for whi they are complete and available, show a slight decrease in t total number of persons found guilty of offences of all kind the number having fallen from 805,336 in 1937 to 787,482. this total no less than 475,124 (rather over 60%) were foun guilty of offences against the traffic laws and under 10% in respe of indictable offences (actual crimes—the large majority in th



PORTABLE RADIO for patrolmen devised for Atlantic City police in 1940. is worn on the belt with an aerial wire thrown back over the shoulders. Pow is supplied by a flashlight battery



A SMALL SPOT LIGHT, attached to the barrel of a revolver, was devised in 1940 to help policemen hunt criminals in the dark. As demonstrated above, the light projects a small circle on the target that the bullets will strike. The beam has an effective range of approximately 50 feet

case being thefts), the remainder being nonindictable cases.

Of the offences against the traffic laws nearly 366,000 were in connection with cars and about 84,100 with pedal cycles; 29,400 persons were found guilty of careless or dangerous driving and 60,000 of obstruction.

Of the 78,463 persons found guilty of indictable offences half were under 21 years of age. Larcenies account for 56,092 convictions and cases of "breaking and entering" rose slightly to 10,814; in these two groups 35% of the former and 63% of the latter were in respect of persons under 17 years of age. Of all the indicted offenders less than 5% were convicted of sexual offences and personal violence; 87·5% of this group were males, the numbers per 10,000 of the total offenders of all kinds being 39 among the males and 5 among the females. Cases of fraud and false pretences numbered 2,749, of receiving stolen goods 2,584 and of violence against the person 1,583.

Of nonindictable cases drunkenness showed a small rise on the year to 52,661, but a large rise on the 1932 total of 33,100; betting and gaming convictions amounted to 18,504; offences against police regulations, by-laws and the licensing of cars, dogs, etc., totalled 68,772; nonindictable assaults 10,699; and offences against the liquor laws other than drunkenness 4,136.

Of all offenders found guilty only 3% received sentences of imprisonment or detention, 6% were bound over, 10% dismissed and cautioned and 81% fined.

It is satisfactory to note the steady decline in the reconviction rate is being maintained.

Murders during 1938, known to the police, numbered 84; in 30 cases the suspect committed suicide, and of those brought to trial 18 were sentenced to death (of whom 9 were hanged, the sentences of the others being commuted to penal servitude) and one ordered to be detailed during his majesty's pleasure on the ground of insanity.

Suicides at 5,263 numbered 98 more than in 1937, but 8 less than the average for the five years 1933–37; 3,303 attempts were reported, 22 more than the recent average.

(L. H. D.)

Croatia: *see* MINORITIES; YUGOSLAVIA.

Crompton, Rookes Evelyn Bell (1845–1940), British engineer, was born May 31 and was educated at Harrow. At the age of 11 he was a naval cadet serving in the Crimean War and was decorated with a medal with the Sevastopol clasp. From 1864 to 1876 he was in the rifle brigade and in 1900 he fought in the Boer War. In the meantime he had engaged in the electrical business and came to be known as the father of the electrical industry in Great Britain. He was made a Companion of the Bath in 1900 and in 1933 became a Fellow of the Royal society. During the World War of 1914–18 he was asked to inquire into the possibility of building "land ships" and as the result of his investigation the first tanks were constructed.

He was twice president of the Institute of Electrical Engineers. He was a delegate to the International Electro-Technical commission in the United States in 1926 which met to consider standardization of electrical equipment. He built a steam automobile and was the founder of the Royal Automobile club. He died in London, Feb. 15.

Crop Insurance. The number of United States wheat growers insuring their crops in 1940 increased 128% over 1939, which was the first year the Federal Crop Insurance corporation issued "all risk" insurance to wheat growers. In 1939 the number of insurance contracts issued was 166,000 to growers in 30 states. In 1940 the governmental corporation issued 379,500 contracts, under which farmers were guaranteed income from 106,477,000bu. of production on 11,300,000ac. in 33 states. This was an increase of 56% over the acreage insured in 1939. The larger percentage gain in the number of contracts, 128%, was because a larger number of small farmers took out policies in 1940. In 1940 the number of winter wheat growers who insured was 310,000, compared with 107,000 in 1939. Spring wheat growers to the number of 69,000 bought contracts in 1940, as against 59,000 in 1939. On the basis of its two years' experience, the Federal Crop Insurance corporation made revisions in rates and indemnities. Premiums equivalent to 14,807,000bu. of wheat were paid by growers in 1940. In 1939 growers paid insurance premiums equivalent to 6,769,120bu. of wheat.

Farmers may pay premiums either in wheat or in cash, although a large majority pay cash. Application for insurance must be made prior to seeding the acreage. The number of wheat crop insurance contracts issued by the federal corporation in 1940 in the principal wheat-growing states was as follows:

	No. of Contracts		*No. of Contracts*
Kansas	60,500	Indiana	28,300
Nebraska	57,240	Minnesota	21,000
North Dakota	31,600	South Dakota	21,000
Ohio	28,700	Illinois	14,800

(*See* also FEDERAL LAND BANKS.) (S. O. R.)

Cruisers: *see* NAVIES OF THE WORLD.

Cryolite. The only known commercial deposit of cryolite in the world is at Ivigtut, Greenland; since this is Danish territory, the industry is closely linked to the trend of affairs in Europe. Shipments in 1938 dropped 15% from 1937 to 44,000 metric tons, 23,000 tons to Denmark and 21,000 tons to the United States; later figures are not available. In some years shipments were made direct to Canada, but in general the Canadian demand was supplied by re-export from the United States, while Denmark supplied the rest of the world. Imports received in the United States in 1940 increased heavily over 1939, but presumably exports to Denmark were discontinued. Since cryolite is a necessary ingredient in the electrolytic bath for the production of aluminium, countries producing this metal are the chief consumers of cryolite, with the U.S. heading the list. Cryolite is also used

CRYOLITE IS MINED only in Greenland. The picture shows a cryolite quarry where the mineral is extracted well below sea level. The industry was disrupted by Greenland's isolation after Germany seized Denmark in April 1940

in the manufacture of opaque glass and small amounts are used in enamels, glazes and insecticides. Some manufactured cryolite has been used in place of the natural product. (G. A. Ro.)

Cuba, a republic occupying the largest of the West Indian islands; language, Spanish; capital, Havana; president, Colonel Fulgencio Batista; area, 41,634 sq.mi. excluding small neighbouring islands. The population, 3,962,344 by the census of 1931, was unofficially estimated at 4,275,000 in Dec. 1940. Approximately 68% are whites. The chief cities (with 1930 populations) are: Havana, 542,522; Santiago, 103,525; Cienfuegos, 87,699. The United States has a leased naval base at strategic Guantánamo bay.

History.—Cuba is under constitutional government, with a regularly elected president and a bicameral congress, as provided by the constitution put into effect on Sept. 15, 1940. Politically, the outstanding events of the year 1940 centred about the deliberations and achievements of the constituent assembly elected in Nov. 1939 for the purpose of drawing up a new constitution for the republic, and about the election of a successor to President Federico Laredo Bru, whose term expired on Oct. 10.

The constituent assembly formally opened its sessions on Feb. 9, and under the presidency of Dr. Ramón Grau San Martín, former provisional president of the republic, proceeded to draft a new constitution. On June 8, the document, embodying some 318 articles, was officially adopted, and became effective Sept. 15. Politically, it provided for a semiparliamentary government with a quasi prime minister responsible to the congress and removable by it through a vote of lack of confidence. The lower house of congress was somewhat reduced in size, with one member for each 35,000 inhabitants instead of 25,000 as formerly, but the senate was enlarged from 36 to 54 members, nine for each province instead of six. Members of the lower house serve four years, half being elected each biennium; members of the upper house were given six year terms, with a third of the membership elected eac two years.

Several articles met with bitter opposition from business inte ests. Among the more outstanding of the ultraliberal social an labour provisions were the requirement of a month's paid vaca tion each year for workers; a 44-hour work week; unemploymen accident and old age insurance; and government-fixed minimu wages. Restrictions on the amount of land which a corporatio might hold were regarded as so vague that further interpretatio would be required. The most bitterly contested feature of a was the transitory provision dealing with "liquidation" of th mortgage moratorium effective since 1934. Its cancellation c accrued interest and reduction of future interest, coupled wit the long terms of amortization allowed, was subjected to attac on the grounds that it was semi-confiscatory and would impa Cuban credit abroad. A transitory clause empowering the govern ment to grant monopolistic manufacturing privileges was subse quently suspended by congress (in October), pending furthe consideration of its effects. A further provision of the constitu tion barred from presidential candidacy anyone connected wit the army within a year preceding the election, but specificall exempted Colonel Fulgencio Batista, who was at the time candidate for the presidency.

On July 14, accompanied by small but spectacular disorders the election of a successor to President Laredo Bru was held. Th election was preceded by a campaign of several months' duration featured by political manipulation and log-rolling as Cuba's te political parties manoeuvred for political advantage. Seven par ties endorsed the candidacy of Colonel Fulgencio Batista, one time army sergeant who had been regarded as Cuba's "Warwick since 1933, when he became the dominant political figure of th nation. The other three parties gave their support to forme provisional president Grau San Martín, regarded as definitely leftist. The actual campaign centred on personalities, however rather than on issues or political philosophies, with groups rang ing from extreme left to extreme right supporting each candidate In the election itself, Colonel Batista won easily, althoug charges of fraud were freely made and formal investigation int alleged election irregularities was necessary before his electio was finally certified. Legal battles over congressional and othe election results were so common that the congress was unabl to obtain a quorum on its constitutional date of assembly (Sept 15). Some elections were undecided until late October.

On Oct. 10 the new president was inaugurated. Politically his greatest problem was to provide adequate representation fo the multifarious groups which had accorded him their support For this reason, his cabinet included 14 members, 4 of them without portfolio. The new president was faced with difficul economic problems, especially financial, due to the unbalanc caused by the European war and by efforts to protect the nationa credit. To this latter end extended efforts were made to obtain a $50,000,000 credit from the United States Export and Impor bank. Earlier, the congress authorized a bond issue to liquidate defaulted gold obligations approximating $20,000,000 due to United States contractors for services during the Machado dictatorship.

The European war and its ramifications played little part in the presidential campaign, for both candidates were staunch advocates of hemisphere solidarity. Anti-democratic minority groups were active, however, during the year. On July 24, immediately after the presidential elections, the Falange Española, a pro-fascist organization closely linked with fascist Spain, was legalized. During the Spanish civil war it had been outlawed to preclude disorder and controversy between it and partisans of republican Spain, but it was given legal recognition after it had

amended its internal organization to conform to Cuban constitutional requirements. Vigorous public disapproval was manifested toward this act, which was regarded as "appeasement." In September, another pro-totalitarian group, the Cuban nazi party, was dissolved by order of the governor of Havana province. Cuban sympathy continued to be predominantly in favour of Great Britain in the struggle against Hitler and in November it was formally advocated in Congress that a gift of 300,000 bags of sugar be made to British civilians.

Administration policy under both President Laredo Bru and President Batista was to give practically unqualified support to the United States. In July Cuba was host to the Inter-American conference held at Havana. Subsequently the government facilitated development of defences. Following the lead of the United States, compulsory military service was authorized and extensive increases in the air force approved.

Education.—Total enrolment in primary schools was 423,420 for the 1937–38 school year. Schoolhouses devoted to primary education numbered 4,115, with more than 8,300 classrooms.

Army and Navy.—Cuba has an army numbering 15,000 men and officers, supplemented by a rural guard of 6,000. In Sept. 1940, compulsory military service for all males between 18 and 35 was required by law. The navy includes 16 small ships. Both army and navy have air services. In Aug. 1940, a new aviation school to train 800 pilots a year for the army air reserve was established.

Trade and Communication.—Cuba has numerous good ports, the most important being Havana and Santiago. Regular, frequent, external steamer communication is maintained, with daily service from Key West, Fla. Havana is on the main route of the Pan American airways. In 1939 international air traffic through the country increased more than 20% over 1938. The entire country enjoys excellent internal as well as external air transport facilities. Land communication is by a railway system (3,850mi., including 250mi. electric), based on an east-west trunk line, and by a network of 2,500mi. of improved highways, principal of which is the 706mi. Central highway from Havana to Santiago. Telephone and telegraph facilities, with 52,740 telephones and 10,939mi. of telegraph lines in 1939, are superior to those of any other western hemisphere country except the United States and Canada. Cuba has 54 radio broadcasting stations.

In 1939, imports totalled $105,862,000, exports $147,676,000, substantially the same as in 1938, with the United States supplying 74·1% of imports and taking 75·3% of exports. Great Britain, with 12·2%, was second best customer. Sugar and sugar products comprised over 76% of all exports in 1939; tobacco accounted for nearly 8%. In the first 9½ months of 1940, however, sugar tonnage exported was 19% less than in 1939. In the first full year of European war sugar exports were 25% less than in the preceding year, while stocks on hand were increased by substantially the amount of lost exports. Accompanying this was a lower sugar price than in the previous period. Total imports in the first 9 months of 1940 were 5⅓% greater than in 1939, but export values declined nearly 10%, with a steady monthly decrease after sugar-grinding season closed in 1940. Tobacco exports in the first 9 months of the year declined 10%. The United States took 86·7% of Cuban tobacco exports. Export of fresh fruits (avocados, grapefruit, pineapples and papayas) advanced sharply, while volume of fresh vegetable exports (largely tomatoes) increased over 50%. The sugar and tobacco export losses were ascribed primarily to trade disruption caused by the European war. In 1939, tourist trade declined, with 135,635 tourists (14% less than in 1938) entering the country. A slight recovery was made in 1940.

Finances and Banking.—The monetary unit is the peso, theoretically equivalent in value to the U.S. dollar, but actually valued in international exchange during 1940 at 88 cents to 93 cents (Dec. 1940 value: 90½ cents U.S.). In 1939, net ordinary revenues were 69,079,000 pesos, actual expenditures approximately 82,000,000 pesos. The 1940 budget presumed 76,000,000 pesos revenue, 75,985,000 expenditures. Actual receipts exceeded estimates, but heavy supplementary credits more than offset, and the year's deficit was expected to be 5,459,000 pesos. The 1941 budget was fixed at 83,986,959 pesos. As of Jan. 31, 1940, the public debt was $135,905,000, exclusive of a floating debt in excess of $50,000,000. In Sept. 1940, congress authorized a loan of $50,000,000.

FULGENCIO BATISTA (right) taking the oath of office as president of Cuba Oct. 10, 1940, at the Presidential palace in Havana

Agriculture and Other Production.—Cuba is primarily agricultural, with sugar, above all, and tobacco the main crops. Set government policy, however, is to encourage crop diversification. World overproduction of sugar has resulted in crop and export restriction by international agreement, under which Cuba is given an export quota of 3,042,011 long tons, of which 1,693,647 long tons may enter the United States. Actual production in 1939 was 2,720,127 long tons, against 5,156,278 in 1929.

Tobacco, the second crop, was faced in 1940 with a chaotic world market condition as a result of the European war, and efforts were made to have all tobacco planting for 1941 proscribed by legislative action, with government compensation to growers. Coffee is increasing in importance, but production is relatively small. Under the Nov. 1940 Inter-American Coffee Quota agreement, Cuba was given a quota of 80,000 bags (of 60kg. each) for export to the United States. Total exports in the first 9 months of 1940 were 81,672 bags.

Cuba has valuable but undeveloped iron, oil, gold and other mineral resources. Total exports of mineral products in 1939 were valued at 4,621,000 pesos.

Manufacturing, except processing of agricultural products, is entirely for domestic consumption, and on the whole quite small. Plans for the erection of Cuba's first automobile tire factory were announced late in 1940. With a daily production of 200 tires, the factory will care for two-thirds of the country's requirements. (*See* also West Indies.) (L. W. Be.; L. C. de A.)

Curaçao, a Netherlands colony in the West Indies, comprising the islands of Curaçao, Aruba and Bonaire in the Leeward group, off the coast of Venezuela, and Saba, St. Eustatius and the southern part of St. Martins in the Windwards;

language, officially Dutch; capital, Willemstad (on Curaçao), pop. 30,453; governor, G. J. J. Wouters. The area of the colony is 436 sq.mi. (Curaçao, 210 sq.mi.; Bonaire, 95 sq.mi.; Aruba, 69 sq.mi.). The population (Dec. 31, 1938 official est.) was 101,021 (Curaçao, 62,798; Aruba, 28,155). The colony is administered by an appointed governor and a council, of whom a majority is elected.

History.—German invasion of the Netherlands in May 1940 had sharp repercussions in Curaçao. To protect the colony's oil refining industry, French and Canadian troops were landed, although the former were later withdrawn. Under war conditions, output of the refineries was considerably curtailed, with adverse effects upon employment and upon business. The colony benefited, however, from the transfer of the Royal Dutch Shell Co.'s home office to Willemstad and from the arrival of numerous refugees who took up residence. Unquestioned loyalty to the Netherlands government in exile was maintained, and proposals made at the Havana conference in July (*see* HISPANIC AMERICA AND THE EUROPEAN WAR) that a Pan-American trusteeship be established over European colonies in America met with sharp disapproval.

Communication.—External and inter-island communication is by steamer, with adequate air service from Curaçao and Aruba. In 1938 an average of over 41 ships cleared daily from ports of the colony.

Industry.—Refining of crude oil, chiefly of Venezuelan origin, on Curaçao and Aruba, dominates the colony's economy, and petroleum, with its derivatives, represents 99% of export values. Total exports in 1938 were 340,545,295 guilders; imports, over 90% crude oil, totalled 391,130,826 guilders. Around 75% of imports (entirely crude oil) normally comes from Venezuela, with miscellaneous imports supplied by the Netherlands and the United States. Under war conditions, the latter became the principal source of general imports in 1940.

Education.—The colony had 49 schools with 11,044 pupils in 1938. Three-fourths of the population is Roman Catholic.

Finance.—The monetary unit is the Netherlands East Indies guilder (since May 1940), valued at approximately 53·5 cents U.S. (*See* also WEST INDIES.) (L. W. BE.)

Curling. The Gordon International medal, the leading trophy in this old Scottish game, went back to Canada in 1940 for the first time since 1938 when the Royal Caledonia Curling club won it in Montreal. Sixteen rinks from the United States and an equal number from Canada competed.

The Douglas medal for the Canadian-United States invitation bonspiel, held at St. Andrew's Golf club, was won by the Schenectady Curling club's rink A, after a thrilling three-day tourney. The Royal Montreal team also took the Munson shield from Utica, N.Y., where it had been since 1932. The Saranac Lake Curling Club won the Patterson medal during the three-day bonspiel at Utica, and the Utica Curling club won the Mitchell medal. The Lake Mahopac club won the Allen medal. (J. B. P.)

Currency: *see* EXCHANGE CONTROL AND EXCHANGE RATES.

Cycling. For the first time in a number of years there was no six-day bicycle race held in New York. The reason was that most of the foreign riders, who in the past added so much colour to the endurance race, were kept at home by the war.

At the same time no world championships in cycling were contested in 1940 for the same reason. Therefore, the world champions succeeded themselves, Arie Van Vliet of the Netherlands retaining the professional sprint title and Jan Derkens, a compatriot, keeping the amateur sprint crown. In the United States Gustav Kilian, good-will German cyclist, dislodged Tino Reboli of Newark from the perch of national professional motor-pac champion, and Mickey Francoise of Montclair, N.J., replac George Shipman as the national professional sprint king. T national amateur sprint crown was won by Buster Logan of A lington, N.J. Ed Carafagnini of Chicago took the A.A.U. seni title and Chuck Edwards, also of Chicago, won the junior A.A. honours.

The revival of cycling in the United States was popularly a cepted both as a sport and as an economic manifestation. T U.S. department of commerce reported that 1,130,736 bicycl were manufactured in the U.S. during 1940, within 50,000 of t banner year of 1899. A movement was in 1940 under consider tion to further cycling in the national parks, and many citi were organizing bicycle clubs and planning extensive cycle pat A network of paths in 20 countries was on the list of the Ame can youth hostels. The New York city department of parks i stalled bicycle paths in 21 of its parks, having a total of near 60mi. of paths, and in Westchester county paths will be co structed.

At Buffalo, Heinz Vopel of Germany and Cecil Yates of CH cago won the six-day international bicycle race, amassing a tot of 170 points after 2,025mi. of riding. When a similar event w held in Columbus, O., Gustav Kilian and Henry O'Brien we the top pair of riders. Vopel also paired with Cesare Maretti win the 18-mi. international motor-paced race in 40 min. and sec. The National Olympic Bicycle Racing championship w captured by Ed Carafagnini, the Chicago bicycle factory worke The New York State championship was taken by Joe McKe of the Long Island Wheelmen's association. He won the one mi match race from George Brown of the Bronx Acme Wheelme Carafagnini also won the national A.A.U. roadracing champio ship at Chicago, with John Crowder of New York second.

Various countries, including the United States, were trainin soldiers in bicycle corps to move from one town to the next a also to carry folding bikes as part of a parachuter's equipmen (T. J. D.)

Cyclotron: *see* CHEMISTRY; MATTER, STRUCTURE OF; MEDICINE; PHYSICS: *Giant Cyclotron.*

Cyprus: *see* BRITISH POSSESSIONS IN THE MEDITERRANEAN.

Czechoslovakia. Formerly a republic in Central Europ Czechoslovakia was dismembered in t fall of 1938, when Germany, Hungary and Poland annexed abo one-third of the territory of the republic, and finally ceased exist in March 1939, when Germany annexed as a protectora the remaining part, inhabited by Czechs (*see* BOHEMIA A MORAVIA). The most eastern part inhabited by Carpath Ukrainians became part of Hungary (*see* RUTHENIA), and t part inhabited mainly by Slovaks was established as a nominal independent state under German protectorate (*see* SLOVAKIA In spite of this dismemberment the Czechoslovaks continued hope and to work for their national resurrection. The Europe war aroused in the Czechs and Slovaks the expectation th Czechoslovak democracy and independence would be revive Most of the national leaders found themselves at the beginni of the war in France and in Great Britain. The oppression of the countrymen in Central Europe increased their will to resistanc and even induced members of the German-protected governme of Bohemia and Moravia, Dr. Jaromir Nečas and Dr. Ladisl Feierabend, to arrange their escape abroad, where they joined t other leaders of the revolutionary Czechoslovak movement.

This movement was under the leadership of Dr. Eduard Bene who as successor of Thomas G. Masaryk had been the last pres dent of the democratic republic of Czechoslovakia. He was reco

nized in 1940 as being still president of the Czechoslovak republic not only by the large Czechoslovak populations in the United States and in the democratic countries of Europe, but also by Great Britain. In the summer of 1940 when the Czechoslovak army, which had fought on the side of the allies in France against Germany, had succeeded in extricating itself from the chaos of French defeat and in re-organizing itself in Great Britain, a full-fledged Czechoslovak government was formed in Great Britain and was recognized officially by the British government on July 21 as the legitimate government of Czechoslovakia, representing its nation as the governments of Queen Wilhelmina or King Haakon VII were representing the Netherlands and Norway. A Czechoslovak cabinet was formed comprising 11 ministers, of whom six were Czechs and five Slovaks. Monsignor Jan Šrámek, the former leader of the Catholic People's party in Czechoslovakia, became prime minister and Jan Masaryk, formerly Czechoslovak minister in London, became minister of foreign affairs. The Czechoslovak military formations were organized as an independent army and on Oct. 25 the British and the Czechoslovak governments signed an agreement which established the Czechoslovak army under its own command and general staff as a part of the allied forces. A further step in the consolidation of the Czechoslovak administration was taken on Dec. 10 when President Beneš formed a state council of 40 members, with the former leader of the Czechoslovak Social Democrats, Rudolf Běchyně, as chairman. This council consisted largely of former senators and deputies of the Czechoslovak parliament who had succeeded in escaping to Great Britain. It was a purely provisional body which was later to give way to the democratically elected new parliament after the liberation of Czechoslovakia.

An important step for the future reconstruction of Central Europe after the war was taken when the Czechoslovak government issued with the Polish government a joint declaration on Nov. 11, 1940, in which the two governments pledged close co-operation in the future in the political and economic field and for military defence. The hostile attitude of Poland toward Czechoslovakia before 1939 had been one of the most important elements in facilitating German expansion in Central Europe and had had fatal consequences not only for Czechoslovakia, but ultimately for Poland herself. In a new spirit the Polish and the Czechoslovak governments declared the past period of discord and recrimination was closed, and that their future close association would form a basis for the new order in Central Europe and a guarantee of its stability. President Beneš thus resumed the policy which he had pursued before the dismemberment of Czechoslovakia and which had always aimed at close and peaceful co-operation between Czechoslovakia and all her neighbours. (*See* also LITTLE ENTENTE; MINORITIES.)

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Dahomey: *see* FRENCH COLONIAL EMPIRE.

Dairying. The year 1940 brought a substantial degree of increasing prosperity to all branches of the dairy industry in the United States. Both production and prices advanced. Increased industrial activity, caused by the national defence program, broadened the buying power and maintained a steady to advancing market for fluid milk and manufactured dairy products in the United States. While the export demand for most United States farm products declined steadily through the year, the demand for manufactured dairy products for export mounted steadily, particularly for condensed, evaporated and dry milk shipped to the United Kingdom. In contrast, competition of European cheese with United States cheese vanished from American markets as imports of European cheese into the United States virtually ceased after the surrender of France to Germany. Normally European cheese imports constituted about 10% of United States cheese consumption. With the disappearance of these imports, large shipments of South American cheeses appeared in the United States. These came principally from Argentina, although a smaller quantity came from Brazil.

They represented the first large imports of South American cheese into the United States. Owing to increased domestic buying power and consumption the index of farm prices for United States dairy products reached 116 by mid-Oct. 1940, compared with the index of prices of the period from 1909 to 1914. At the same time the index for all farm products stood at 99 while that for meat animals, which caused the largest percentage of increase in farm income in 1940, was 112. Average retail price for butter the first nine months of 1940 was 35·1 cents per lb. compared to 32·5 cents in 1939. Average price paid farmers for butter fat the first nine months of 1940 was 22·3 cents per 0·8085lb. compared to 19.6 cents in 1939. Average retail price for cheese the first nine months of 1940 was 25.8 cents per lb. compared to 25·3 cents in 1939.

Average price paid farmers for milk by Wisconsin cheese factories the first nine months of 1940 was 13·1 cents for 10·43lb. of milk compared to 12·1 cents in 1939. Average retail price of evaporated milk in 1940 was 7·7 cents per lb. compared to 7·5 cents in 1939. Average price paid farmers by condenseries the first nine months of 1940 was 3·08 cents for 2·3lb. of 3½% milk compared to 2·85 cents in 1939. In November, prices of butter futures on the Chicago Mercantile exchange made a new top for the years 1938–40. Milk production throughout 1940 was at a high level and on Nov. 1 production per cow was 4% above the same date in 1939 and the highest on record for that date.

During 1940 the number of cows on United States farms increased by about 500,000 head. Feed supplies were ample to sustain still further milk production, the four principal grain feeds, including the 1940 corn crop, constituting a supply of 113,000,000 tons, the highest in 20 years. Production of manufactured dairy products in the United States, creamery butter, cheese, evaporated, condensed and dried milk and ice cream, increased 16% in the 1930–39 period while population increased only 6%. (For details of production and consumption *see* BUTTER; CHEESE; MILK.) (S. O. R.)

Daladier, Edouard (1884–), French politician, of whom a biographical notice will be found in *Encyclopædia Britannica,* vol. 6, p. 985. Minister of war in 1925, president of the Radical-Socialist party after 1927, he formed in 1933 a ministry which lasted ten months, and then served under Sarraut and Chautemps. In 1934 he formed another government which, as a result of the riots following the Stavisky scandal, lasted only a few days. Minister of war after 1936 in various *Front Populaire* governments, in April 1938 he became prime minister.

Daladier's war cabinet, formed Sept. 13, 1939, after the declaration of war against Germany, fell on March 20, 1940, when the chamber of deputies withheld a vote of confidence, partially because of France's failure to give effective aid to Finland. His successor, Paul Reynaud (*q.v.*), retained Daladier as minister of defence and war (and later foreign minister) until June 6, when he was dropped from the cabinet. On July 23 the Vichy government ordered him to be tried, along with other former officials, on charges of responsibility for France's defeat. He was taken into custody Sept. 7 and formally arrested Nov. 17 to await trial before the Riom court.

Dalai Lama: *see* TIBET.

Chief Dams Completed or Under Construction During 1940

Name of Dam	River	Place	Type	Maximum Height, Feet	Crest Length, Feet	Volume (cu. yds.)	Purpose*	Built by	P re
Denison	Red	Texas, U.S.	Earthfill	165	14,000	17,370,000	F, P	U.S. Army Engineers	
El Azucar	San Juan	Mexico	Earthfill	142	18,900	5,677,031	I	Mexican National Commission of Irrigation	
El Palmito	Nazas	Mexico	Earthfill	295	1,005	6,632,348	I, P	Mexican National Commission of Irrigation	
Fort Peck	Missouri	Montana, U.S.	Earthfill, hydraulic	242	9,000	122,700,000	F, P, N	U.S. Army Engineers	
Friant	San Joaquin	California, U.S.	Concrete, straight gravity	300	3,430	2,200,000	I	U.S. Reclamation Bureau	
Fuihodo	Yalu	Manchoukuo		298	2,730	3,530,000	P	Yalu River Hydro-Electric Co.	
Genissiat	Rhone	France	Concrete, straight gravity	330	650	..	N, P	Compagnie Nationale de Rhone	
Grand Coulee	Columbia	Washington, U.S.	Concrete, straight gravity	550	4,300	10,200,000	I, F, P	U.S. Reclamation Bureau	
Green Mountain	Blue	Colorado, U.S.	Earth and rockfill	285	1,300	4,861,000	I, P	U.S. Reclamation Bureau	
Hansen	Big Tijunga	California, U.S.	Earthfill	122	10,509	14,000,000	F	U.S. Army Engineers	
Haweswater	Haweswater	Westmoreland, Eng.	Concrete, hollow buttressed	144	1,540	140,000	W	Manchester Corporation	
Hiwassee	Hiwassee	North Carolina, U.S.	Concrete, straight gravity	308	1,285	795,000	F, N, P	Tennessee Valley Authority	
Kingsley	North Platte	Nebraska, U.S.	Earthfill, hydraulic	162	11,000	26,000,000	I, P	Central Nebr. Public Power and Irrigation District	
La Angostura	Bavispe	Mexico	Concrete arch	291	515	175,871	I, P	Mexican National Commission of Irrigation	
Marshall Ford	Colorado	Texas, U.S.	Concrete, straight gravity	270	2,623	1,868,700	I, F, P	U.S. Reclamation Bureau	
Merriman	Rondout	New York, U.S.	Earthfill	200	2,500	6,600,000	W	N.Y. Board of Water Supply	
Pensacola	Grand River	Oklahoma, U.S.	Concrete, hollow buttressed	152	4,284	500,000	P, F	Grand River Dam Authority	
Sardis	Little Tallahatchie	Mississippi, U.S.	Earthfill, hydraulic	117	14,500	16,800,000	F	U.S. Army Engineers	
Shasta	Sacramento	California, U.S.	Concrete, straight gravity	500	3,500	5,400,000	I, F, P	U.S. Reclamation Bureau	
Stevens	White	Washington, U.S.	Earth and rockfill**	425	700	2,100,000	F	U.S. Army Engineers	

*I=Irrigation, F=Flood control, P=Power, N=Navigation, W=Water supply, C=Completed in 1940, U=Under construction, **Highest in world.

Dams. The table above includes only 20 of the many important dams completed or under construction during 1940. Widely scattered over all the world, a large proportion were being built for irrigation purposes.

The largest of these were in the United States. Grand Coulee, world's largest concrete dam, neared completion with more than 95% of its concrete in place.

Shasta, second largest, part of the great Central Valley project in California, received its first bucket of concrete on July 8 following the completion of over 4,000,000 cu.yd. of foundation excavation begun in 1938. On the extensive 30-mi. relocation of the Southern Pacific railroad the last of the 12 tunnels was holed through in June. Two unique structures are required in building this dam. One is the $9\frac{1}{2}$-mi. belt conveyor which is used to transport sand and gravel for the concrete to the dam site. The other is the 460-ft. high steel tower, from the top of which seven cableways radiate to deliver concrete to all parts of the dam. Heavy rains in January and February, finally culminating in the worst flood of record on the Sacramento river, delayed the work, severely damaging the bridges for the belt conveyor, access road and railroad relocation. On another section of this project, the first bucket of concrete was placed, July 29, in Friant dam, world's fourth (Boulder is third) largest concrete dam.

The outstanding event of the year 1940 in the field of dams was the final completion of Fort Peck, world's largest dam, under construction since Oct. 1934, containing 122,700,000 cu.yd. of hydraulic earth-fill. The upper 25ft. of fill was constructed during 1940 by transferring material from the previously built downstream face of the dam itself.

Kingsley dam, second largest earth-fill, was also nearly com plete. The top 20ft. of fill remaining will be taken from excavation for the auxiliary spillway, and will be rolled in place.

Stevens dam, the highest of its type in the world, was changed in July from an earth-fill to a rock-fill with an earth core. This was necessary when it was found that the proposed material for the dam contained an objectionable percentage of fine clay. The wet climate would have made placing of this material quite difficult and the change was also expected to facilitate construction by making work possible even during the rainy season. The change in type reduced the total quantities in the dam by about 900,000 cu.yd. Foundation preparations were in progress at Merriman dam, large earth-fill for New York city's water supply. Twelve of the 18 reinforced concrete caissons being sunk 180ft. to rock have been completed. These caissons will form a cut-off wall to prevent seepage under the dam, similar to that built Windsor dam in Massachusetts, completed in 1939.

In spite of war conditions work proceeded on the Haweswa dam, vital water supply project for Manchester, Eng., and w on a large multiple-arch dam was started on the Kromme ri in South Africa to supply water to the city of Port Elizabe Kalkfontein dam, second largest in Union of South Africa, completed. Built for irrigation on the Riet river, it is 11 high, 1,040ft. long and contains 270,000 cu.yd. of rock-fill.

Although the concrete core wall for water tightness has b generally abandoned on earth dams in the United States beca of its inflexibility, the Pegu-Yomas dam in Burma was comple in 1940 with such a wall used for want of good core materi The wall is 130ft. high and 350ft. long, built in panels of re forced concrete and designed to withstand the earthqua typical of that locality. It was expected that this wall co deflect as much as 16ft. at the centre without causing leaka The dam was built for the water supply of the city of Rango (*See* also AQUEDUCTS; IRRIGATION; WATER POWER.)

(W. P. C.)

Dance. Continuation of the European war, and of gene jitters in the United States, made for the rising po larity of social dancing during 1940. The hectic pace echo by the headlines was reflected in the more spirited types dancing prevailing on ballroom floors in the U.S.

Greatest strides were observed in the Latin-born routines, c perhaps to the political and economic emphasis on Latin-Ame can relations. The rhumba, Cuba's contribution to torrid da ing, reached its crest during 1940, and the conga soared to n heights of popularity. Night clubs and cabarets, in the La motif, mushroomed into being all over the continent. Ma cafes installed a rhumba band to alternate with a U.S. orchest so popular has Latin dancing become. The great success of t conga can be attributed to the fact that it is ideally adapted group participation. The conga can be performed in the tra tional couple formation, or, like the Lambeth Walk, can executed as a group performance. Arthur Murray capitalized the dance's group characteristics and created the Americong wedding the thoroughly American Virginia reel with the Lati conga. The Rhumba-Reel, another Murray creation, whi gained popularity at the year's end, is an Americanization the rhumba.

The Virginia reel itself, along with other U.S. folk danc

Above: CONSTRUCTION WORK on the Upper Narrows dam, Yuba river, Calif., as it had progressed by May 15, 1940

Right: FORT PECK DAM on the Missouri River in Montana, largest dam in the world, was completed in 1940

Below, left: PROGRESS VIEW of excavation work in 1940 on a canyon wall at the site of a flood control dam on White river, Washington

Below, right: ROZA DAM, on the Yakima federal irrigation project, Washington, was completed in 1940

enjoyed renewed popularity during 1940. Hillbilly music, back-to-the-soil movements, and "gay '90s" trends have all helped to revive this typical U.S. country dance. Revived in the middle west of the U.S. early in 1939, the Virginia reel was picked up in New England, and, by the end of 1940, was quite a favourite in all parts of the country.

Jitterbug dancing continued to thrive in certain sections, with the Lindy Hop enjoying a renewed popularity. With swing bands still in the limelight, the younger and more energetic dancers have refused to relinquish this type of dancing which many predicted would end in 1940. "Jitterbugging" was probably the factor responsible for the appearance, in great numbers, of Saturday night social dance clubs all over the U.S. This type of affair was especially popular in the big cities, and was well patronized by the younger dancers in search of swing and the chance to widen their acquaintanceship. The swing dancers were also in the majority at the San Francisco and New York world's fairs' open-air public dancing festivals.

England, which in previous years has contributed such "polite" routines as the Lambeth Walk, the Chestnut Tree, and the more recent Boomps-a-Daisy, was too much occupied with more trying events to interest the U.S. in a new dance in 1940. Those three aforementioned British dances were declining steadily in popularity in the United States.

A dance which made its initial appearance in 1940 was La Varsoviana, which combines the graceful mazurka with the schottische. La Varsoviana was featured in the Columbia picture, *Arizona.* The U.S. motion picture industry, incidentally, once again placed emphasis on dancing as a social grace during 1940. The year saw the art exploited in such pictures as *Dance, Girl, Dance; Down Argentine Way; Dancing on a Dime,* and the Fred Astaire picture *Second Chorus* in which Arthur Murray's newest routine, "Dig-It," was introduced. (A. Mu.)

Folk Dancing.—In the United States folk dancing is represented by two types: the Indian dance rituals or ceremonials, carried on chiefly in the pueblos of the southwest, which are a definite part of Indian life bearing actual relationship to their existence; and folk dancing of a social and recreational nature enjoyed in all sections of the country by uncounted thousands.

During 1940, the Indian dance rituals were doubtlessly witnessed by more visitors than ever before, attracted to New Mexico and Arizona by the Coronado Cuarto Centennial celebration. This celebration likewise stimulated a widespread revival of the Spanish-American dances of this section and of the pioneer square dances of Anglo origin. From January through December more than 150 folk festivals were held in the schools, villages and cities throughout New Mexico.

In the U.S. as a whole, reports from many sources indicate a marked increase in folk dancing of the social or recreational type, with early American dances the widespread favourites. For example, the Work Projects administration recreation program with its country-wide activity estimated a 33% increase in the number folk dancing under their leadership. At least 200,000 dance together monthly, representing over 2,000 groups, half of which meet weekly. It was further estimated that 75% of these dancers were married couples over 30.

Colleges and universities in 29 out of the 32 states heard from reported regular social events featuring folk dancing and, in many cases, enthusiastic coed square dance groups meeting weekly. From the National Grange came word that folk dancing, especially square dancing, was being featured in some granges in nearly all the 37 states in which the grange was organized. In the rural areas rise the colourful personalities of "callers" and their musicians. The old timers reported a far larger percentage of young folks and greatly speeded tempo.

The usual annual festivals and institutes were held in 1940, as follo folk dance leadership sections at the 25th National Recreation congre Cleveland, Ohio; 20th May festival at Pine Mountain Settlement scho Kentucky; 14th Spring festival of the Country Dance society (formerly English Folk Dance and Song society) in New York city, and their 1 summer school in Massachusetts; 13th Mountain Dance and Song festi Asheville, N.C.; 11th short course at the John C. Campbell school, Bra town, N.C.; 10th American Folk Song festival at Traipsin' Woman Cab Kentucky; 9th White Top festival, Virginia; 9th Spring festival of foreign language department of Montclair State Teachers' college, Mo clair, N.J.; 8th Vermont State festival in Plainfield; Texas Cowbo Christmas ball, Anson (held originally in 1885, revived in 1933); International festival in Milwaukee, Wis.; 7th National Folk festi Washington, D.C.; 6th International festival, Denver, Colo.; 5th Mount Folk festival of the Conference of Southern Mountain Workers, Knoxvi Tenn., and their 3rd Folk Dance school, Berea, Ky.; 5th National sch of the Co-operative Society for Recreational Education, Tiffin, O.; International festival of the International Institute of Boston, Mass.; Folk festival of Dauphin County, Harrisburg, Pa.; 5th Christmas festi of the University of California in Los Angeles; 5th International festi in the cultural Olympics, University of Pennsylvania, Philadelphia; festival of College of Fine Arts, University of New Mexico, Albuquerq 2nd Connecticut Dance and Song festival, Storrs; County festival, Morg town, W.Va.; Square Dance festival, Storrowton Village, West Springfie Mass.; Old Timers' Day square dance at El Paso's Sun Carnival, Tex led by famous Bluebonnet club; Robinson Harvest festival, University Kentucky; International festivals at International houses of Berkel Calif., Chicago, Ill., and New York city, at International Center, Ba more, Md., and at International institutes of Boston, Duluth, Fresno, I Angeles, Lowell, Mass.; New York, Providence, Toledo and Trenton; Sh course and festivals of the Co-operative Recreation service, Delaware, Folk Dance institutes at Henry Ford's county school, Ways, Ga., a Greenfield Village, Dearborn, Mich.; Girl Scout and Camp Fire C festivals; recreation conferences of Co-operative Youth Councils of Oh Grape festivals and Basque Pique-Nique, California; and the year-rou festival of Mexican dance, drama and song, Padua Hills theatre, Californ

For the first time in 1940, folk dancing was included in t fashionable Kentucky Mountain Laurel festival in Pinevil state-wide recreation institutes were held in Indiana, leading a State Play-Party festival in Kokomo, sponsored by the agric tural extension department of Purdue university and the Inter nominational Church Youth; a Pre-Convention Working Dar conference was held at the University of Chicago under the N tional Dance Section of the American Association for Heal Physical Education and Recreation; an intensive Western Ame can Dance institute took place at the Cheyenne Mountain scho Colorado Springs, Colo.; and a five-months' American-Inter tional festival was carried on as part of the program of American Common, World's Fair 1940 in New York city.

Outstanding in their far-reaching influence in the folk-dan field in 1940 were Benjamin B. Lovett and his staff, operat from Greenfield Village, Dearborn, Mich., and Dr. Lloyd Sh and his Cheyenne Mountain Dancers, Colorado Springs, Co (P. Pa.)

Ballet, art dance of the theatre grown from classical traditi throve in 1940 despite the spread of war. Evacuées from Euro swelled the lists concentrating activity in the western hemisphe while Australia and New Zealand welcomed De Basil's Origi Ballet Russe in an eight months' season.

Under bombs in England, ballet carried on. The Vic-Wells co pany escaped from Holland at the brink of the invasion, tou the British provinces, extended its season at Sadler's Wells a produced new works: *Dante Sonata* and *The Wise Virgins* (A ton) and *The Prospect Before Us* (De Valois). In August M De Valois revived her *Barabau,* a topical laugh at dictators. T Arts Theatre ballet, the Ballet Rambert and the London bal combined in the Arts Theatre club, gave lunch, after-lunch a tea performances, "with snacks in the foyer-shelter," to circu vent blitz and black-out. The *Dancing Times* published regula

In South Devon the Jooss ballet maintained its school until leaders, Kurt Jooss and Sigurd Leeder, were interned, when maining students, mostly Dutch, continued under direction Pem Becker. The company (Fritz Cohen, musical directo toured part of the United States with *Chronica* (dance-drama dictatorship) and the revised fairy ballet, *A Spring Tale,* missed the scheduled New York spring season of full repert (ten original ballets) because of theatre tie-up, and soon embar

for their first South American tour, which became extended by return engagements.

The Original Ballet Russe gave four world premières in the Antipodes: Schwezoff's *Eternal Struggle,* Lichine's *Graduation Ball* and Verchinina's *Devotion* and *Étude,* which had American premières in Los Angeles in Oct. 1940, together with Lichine's *Protée,* Fokine's *Paganini* and *Cinderella.* Following a short Chicago season, the company opened an indefinite engagement at the Fifty-first Street theatre, New York, at the close of the Monte Carlo ballet's three weeks' stay, S. Hurok managing both companies. Lichine's version of *The Prodigal Son* and Lifar's *Pavane* were other new works in a repertory of 50 ballets.

THE "BOMBER PARADE," a new British dance of 1940, was a rhythmic parody of German attempts to knock out Great Britain from the air

Newcomers to these ranks were: Schwezoff, author of the prize-winning autobiography, *Borzoi* (in England); Lifar, touring the Antipodes but not the United States; Nemchinova, formerly of the Diaghilev ballet; Panaieff; Skibine; Toupine and a new set of "baby ballerinas"—Denisova (from Vancouver), Moulin, Leskova, Svetlova and Stepanova. Baronova, who had toured South America as guest artist with the Monte Carlo company, rejoined De Basil for the American tour, thus (with Toumanova and Riabouchinska) bringing the three "baby ballerinas" of the first seasons together again. The nucleus remained as before.

Detoured by war from its annual spring season in Monte Carlo and subsequent engagements in European capitals, the Ballet Russe de Monte Carlo, Leonide Massine, artistic director, made its first tour of South America instead, giving 65 performances in five of the major cities. In Oct. 1940, the company, the personnel practically intact as of previous seasons, opened the fall season at the Fifty-first Street theatre, New York city, since the Metropolitan Opera house, their usual centre, was in process of renovation and at the end of the engagement the company departed for the annual transcontinental tour.

The five novelties were: Massine's *The New Yorker* and *Vienna—1814* in world premières; the Stravinsky-Balanchine *Poker Game* and Tschaikovsky-Balanchine *Serenade,* both originally produced by the former American ballet; and a revival of the Tschaikovsky-Petipa *Nutcracker.*

The new Ballet theatre, a U.S. institution of international make-up and outlook, made its debut at the Center theatre, New York in Jan. 1940, with a distinguished array of dancers, choreographers, composers and stage designers, all collaborating in fresh productions including restyled revivals of the classics. Loring's *The Great American Goof* (Saroyan, librettist) was one of the chief novelties. Bolm contributed *Peter and the Wolf* and his revised *Mechanical Ballet;* Fokine, *Les Sylphides* and *Carnaval* restaged under his direction; Mordkin, *Voices of Spring.* Dolin restaged *Giselle* and *Swan Lake* and presented his new *Raymond Scott Quintet;* Tudor brought *Jardin aux Lilas, Dark Elegies* and *Judgment of Paris;* Howard, *Lady into Fox* and *Death and the Maiden.* De Mille created *Black Ritual* for the Negro section, Fernandez, *Goyescas* for the Spanish. Shabelevsky did an *Ode to Glory* in honour of Poland, his fatherland. Nijinska furnished new choreography for Mordkin's production of *La Fille Mal Gardée.*

The season stopped short at the end of three weeks' brilliant success. The company gave a series of summer performances at the Lewisohn stadium and in November joined the Chicago Opera for a six weeks' season, offering there several new works among many planned for the New York season in Jan. 1941.

Ruth Page and Bentley Stone, with an enlarged company, made a Latin-American tour in the region of Caracas and Curaçao. Margaret Wallman directed opera ballet in Buenos Aires. The Graff ballet made an eastern tour during the winter, retiring in summer to a co-operative farm in Vermont to prepare for a more extended tour in the fall.

Ballet made its second appearance as an advertising medium when Kirstein's American Ballet Caravan, assisted by other dancers, gave continuous performances in the Ford Motor company theatre at the World's Fair of the ballet skit, *A Thousand Times Neigh.* (Lenthéric Perfumes had previously produced little ballets in department stores as part of an advertising campaign.) Kirstein reorganized the School of the American Ballet, as president, and was instrumental in founding the Dance Archives at the Museum of Modern Art.

Ice ballet stepped out of the arena into the Center theatre in the fall, with the "icetravaganza," *It Happens on Ice,* dances staged by Catherine Littlefield, who also staged the dances for the World's Fair's *American Jubilee,* notable for its bicycle ballet.

Balanchine staged dances for several shows. Zorina appeared in *Louisiana Purchase* (Broadway musical) with Charles Laskey, partner, and in the motion picture, *I Was an Adventuress* (Lew Christensen of the American Ballet Caravan, partner); Baronova in M.G.M.'s *Florian.* Walt Disney's *Fantasia* utilized ballet technique from living models for cartoon drawings. Radio talks on ballet and radio interviews with ballet artists were frequently given.

BIBLIOGRAPHY.—United States: Serge Lifar, *Serge Diaghilev, an Intimate Biography* (1940); Ruth Eleanor Howard, editor of the *American Dancer,* published *Dancer's Almanac and Who's Who, 1940.* In England, Arnold Haskell published another ballet picture-book, *Tribute to Poland.*

Concert dance, embracing Spanish, oriental, modern and other forms of art dance performed in solo or group recitals as distinguished from the theatrical presentations of ballet, also concentrated in the United States in 1940 as the result of war conditions and opened up channels of exchange between the Americas.

From conquered countries, where dancing was either banned or curtailed along with other expressions of the free spirit of man,

VERA ZORINA danced to critical acclaim in *Louisiana Purchase*, a top musical show of 1940

fled many refugees, the Viennese dance-mime, Lotte Goslar, among them. Total silence submerged Mary Wigman and her followers in Germany. Harald Kreutzberg, detained in nazi-held territory from what would have been his eleventh United States tour, remained incommunicado.

New York, in 1940 the dance capital of the world, was the clearing house for a concert dance as polygenous as its people. Here debuts were made—in the Spanish field by Carmalita Maracci, Manuela del Rio, La Trianata, Cuquita Blanco, Ana Maria; in the Negro by Katherine Dunham of Chicago, whose hit program, "Tropics and Le Jazz 'Hot,'" was repeated on ten consecutive Sunday evenings by request, and who later with her company scored another hit in the Broadway Negro show, *Cabin in the Sky*. From Korea came Sai Shoki; from Bali and Java, Devi Dja and her native dancers and musicians. And there were already active in the metropolis alone, and to a lesser degree in rest of the country, more African, Hindu, Jewish, oriental, Sp ish and other specialists, American and native, as well as mod American dancers, than there is space here to list.

At the beginning of her fall tour across the continent, Arg tinita introduced a new male partner, Federico Rey, into Spanish ensemble, and décor into some of her dances. Triana, former partner, was said to have joined Carmen Amaya, Spanish gypsy dancer whom Hurok had brought from So America (American debut deferred until 1941).

La Meri, American ethnological dancer, forced home from f eign travels, toured extensively, and in conjunction with Ruth Denis in New York founded the School of Natya, where fc nightly programs of eastern dances were popular. Huapala, other American girl (Vivienne Mader), toured with her group Ilima islanders in programs of authentic Hawaiian dances. An Enters, world-commentator in dance-mime, added an Hawai engagement to her annual transcontinental tour. Reginald a Gladys Laubin continued their work in the American Ind dance. Miriam Winslow and Foster-Fitz-Simons toured Uni States and parts of Canada and arranged for a South Ameri tour in the spring of 1941. Ted Shawn disbanded his men danc at the peak of success. Anna Sokolow at invitation of the Me can government established the first professional modern da group in Mexico.

The pioneers and chief exponents of the modern Ameri dance—Martha Graham, Doris Humphrey, Charles Weidmar and Hanya Holm, former Wigman dancer now resident in United States, continued to teach, tour, experiment and prod new works. Experiments included use of words with moveme appearances in television, radio talks and private movie-maki

In August, Graham produced a new composition on Em Dickinson, *Letter to the World,* and *El Penitente* at the Benni ton festival sponsored by the former Bennington School of Dance which became in this its seventh season the Benning School of the Arts.

The Humphrey-Weidman company opened a new studio-thea on West 16th street, with a festival series of performances dur the Christmas holidays, in which Humphrey's *Song of the W* and Weidman's *Flickers* were added to their large repertory cluding Humphrey's *Square Dances* and Weidman's *On Mother's Side,* done on tour. Lester Horton and his group w active on the west coast, where Mills college also conducte summer school of dance dedicated chiefly to the modern fo Tamiris (Margaret Severn), reopened activities in New York.

While the trend of the modern dance is toward theatre— substantial, full-length production, with some décor, more lav costumes and small orchestra when possible supplanting the p gram of short pieces against a plain cyclorama, in stark costu with piano and percussion the sole music, of earlier, experimen days—the question of finance has so far prevented its full velopment in this direction.

The schools and colleges throughout the land have done m to sponsor the modern form. In New York the Washington Irv high school and the Young Men's Hebrew association each ma tain a notable annual series of events which include the best all kinds of concert dancers.

BIBLIOGRAPHY.—Margaret N. H'Doubler, *Dance: A Creative Art Exp ence* (1940); Ted Shawn, *Dance We Must* (a series of lectures given the Peabody College for Teachers) (1940). (M. L.

Daniels, Arthur Hill (1865–1940), professor emeritus the University of Illinois, was b in East Medway (now Millis), Mass., Oct. 19. He was educa at Olivet college and Yale and Clark universities, receiving Ph.D. degree from Clark in 1893. He joined the faculty of

University of Illinois the same year as an instructor in philosophy, becoming a full professor in 1899. Later he served at various times as acting dean and as dean, and in 1933–34 he was acting president, after which he became professor emeritus. He died in Urbana, Ill., April 2.

Danube, Control of. On March 1, 1939, Germany was given a seat on the International Danubian commission, while Rumania was accorded full sovereignty over the lower reaches of the river. On Sept. 17, 1940, Germany abolished the commission and replaced it with a "consultative committee" on Danubian affairs, under a permanent German director, Dr. George Martius. This new committee was composed of delegates from Italy, Hungary, Bulgaria, Yugoslavia and Slovakia, to be convened and adjourned by the director. The soviet union then demanded and received representation on the committee. These changes brought the great water highway under the control of the Berlin-Rome axis, and ended the international regime established in 1856. (S. B. F.)

Dartmouth College. The total student enrolment in 1940 was 2,431. The number on the faculty and administrative staff was 297. Support of Dartmouth alumni through the annual alumni fund campaign again provided funds for current use that enabled the trustees to avoid a substantial deficit. The alumni fund collections were $126,255.90, received from 10,181 contributors. Another notable achievement on the alumni front was the success of Hanover holiday, or the alumni college, held during the week following commencement. Attendance of more than 200 at the lectures and discussions led by members of the faculty again proved the popularity and significance of postcollege education in the alumni body.

A major project ahead, designed to benefit both curricula and extracurricula activities in certain branches of the arts, is the proposed new centre for drama, music and radio. During the year plans were completed for the $1,000,000 centre and approved by the trustees. Construction is contingent upon securing funds for the project. The Dartmouth centre will be used during the summer of 1941 for a drama festival of national scope and importance. (S. C. Ha.)

Daudet, Julie Allard (1847–1940), French writer, widow of Alphonse Daudet, was born in Paris. Under the name of Marguerite Tournay, she began to publish poetry in 1865, two years before her marriage to M. Daudet. She later contributed to Paris reviews, signing her articles Karl Steen. Her best-known books are *Impressions de Nature et d'Art* and *L'Enfance d'une Parisienne*. She was a Knight of the Legion of Honour and a member of the jury of the Prix Femina. She was the mother of Léon Daudet, a leader of the French Royalist party. She died in Paris, April 23.

Daughters of the American Revolution. The national society, Daughters of the American Revolution, organized Oct. 11, 1890, makes eligibility for membership dependent upon direct descent from a patriot who aided in securing American independence. Membership Dec. 1, 1940, approximated 143,000 in 2,550 chapters in every state and in many countries.

Activities of 1940 included the issuing of 380,000 manuals for citizenship published in 18 languages, to aid in naturalization; instruction in the use of leisure and respect for the rights of others of 147,000 children in Junior American Citizens' clubs; gifts of $90,000 for 16 approved schools for foreign-born and southern mountaineers. Improvements for these schools included a boys' dormitory, two health houses, a library building, a model farm, teachers' cottages, classrooms and kitchens. Two of these schools, Tamassee in South Carolina and Kate Duncan Smith on Gunter mountain in Alabama, with approximately 700 pupils, are completely owned and operated by the D.A.R. Loans were made to 565 students. About 5,000,000 penny pines were planted in all states of the union in commemoration of the national society's 50th anniversary. Three social workers were maintained in the detention rooms at Ellis island and for occupational therapy among men of the coast guard and merchant marine confined in the Marine hospital. Individual state projects in commemoration of golden jubilee included erection of an outdoor theatre for public use, restoration of important historical buildings, endowed rooms in hospitals, etc. A high school senior from every state, winner of the Good Citizenship contest, was given a trip to Washington. About 50,000 copies of *National Defense News,* designed to promote confidence in fundamentals of American democracy, were distributed. Eighteen thousand copies of the constitution of the United States were given upon individual requests following radio programs. Three thousand medals for good citizenship were awarded. Distribution of Flag Codes and other patriotic literature reached into hundreds of thousands. The society publishes the *National Historical Magazine.* A genealogical library of 32,000 volumes and an early American museum are open to the public in the society's headquarters, Memorial Continental hall, Washington, D.C. (S. C. Ro.)

Davies, William Henry (1871–1940), English poet, was born in Newport, April 20, and died at his home in Nailsworth, Gloucestershire, Sept. 26. For a biographical sketch see *Encyclopædia Britannica,* vol. 7, p. 83.

Davis Cup: *see* Tennis.

Dawes, Rufus Cutler (1867–1940), U.S. financier, was born in Marietta, Ohio, July 30. He was a kinsman of William Dawes, who rode with Paul Revere to warn Concord and Lexington of the British plans to attack them. After graduation from Marietta college in 1886 he was associated with his father in the lumber business. In 1897 he went to Evanston, Ill., as president of the Northwestern Gas Light and Coke company and for the next 30 years he was active in the management of gas and electric companies in association with his brother, Charles G. Dawes. He was president of Chicago's Century of Progress exposition, 1933–34. Following the World War of 1914–18 he served as adviser to the commission which drew up the plan for the settlement of the German reparations question and he became assistant to Owen D. Young as general agent of reparations. He died in Chicago, Jan. 8.

Deafness. **Hearing Aids.**—Individuals who have difficulty in hearing ordinary conversation in office, home or in relatively quiet places at a distance of six feet or less may be helped by the use of a hearing aid. A clinical examination, including an audiometric test of the deafened person, will usually indicate to the otologist whether or not the instrument will help.

In 1940, manufacturers emphasized the so-called vacuum tube hearing aid employing tiny thermionic tubes installed in miniature amplifiers. Vacuum tube hearing aids, weighing approximately 25oz. complete, consist of a small crystal microphone and miniature amplifier built in a wearable case (5oz.), A and B batteries (18oz.), a receiver (2oz.) and wire connections. The receiver may be of two types: air conduction, a small button type receiver fitting closely in the better ear; or bone conduction, a receiver

supported by a spring headband and resting on the mastoid back of the ear. An otologist's examination can usually predict which method, bone or air conduction, will be the more satisfactory.

Carbon granular microphone hearing aids, weighing approximately 25oz. complete, are marketed. They are giving reliable service although the trend appears to be toward vacuum tube aids.

The cost of operating the two kinds of aids is about the same; however, the carbon granular hearing aids may be slightly less expensive in battery and upkeep cost. The vacuum tube aid is comparatively new and may have defects which are not readily discernible, whereas the carbon granular hearing aid has been in use for many years and is considered a rugged instrument.

A list of accepted hearing aids may be obtained from the Council on Physical Therapy of the American Medical association. The council has also compiled requirements for acceptable electric hearing aids and audiometers, copies of which may be obtained by writing to the office of the council. (*See* also EAR, NOSE AND THROAT, DISEASES OF.)

BIBLIOGRAPHY.—"Minimum Requirements for Acceptable Audiometers," *J.A.M.A.*, 112:732 (1939); "Tentative Minimum Requirements for Acceptable Electric Hearing Aids," *J.A.M.A.*, 114:1881 (1940). (H. A. C.)

Deaths (of prominent persons in 1940): *see* OBITUARIES.

Death Statistics.

According to provisional reports, which never deviate very far from the final, there were 1,387,797 deaths in the United States during 1939 and the corresponding death rate was 10·6 per 1,000 of total population. In the same year, Canada recorded 108,874 deaths and a death rate of 9·6 per 1,000 population. There were 499,192 deaths reported for England and Wales during 1939, excluding non-civilian deaths on and after Sept. 3; the death rate was 12·1 per 1,000 population.

Death rates for a number of countries for the most recent year available will be found in the appended table. Only four of these countries had death rates below 10 per 1,000 population in 1939, namely, Australia (9·9), Canada (9·6), the Netherlands (8·7) and New Zealand (9·2). Countries with death rates greater than 20 per 1,000 population in recent years are: British India (24·3 in 1938), Chile (24·6 in 1939), Egypt (26·4 in 1938) and Mexico (22·3 in 1939). Many backward countries without adequate mortality records undoubtedly experience death rates even higher than these.

Within the United States, the death rates per 1,000 population in 1939 were lowest in North Dakota (7·7), South Dakota (8·0), Oklahoma (8·0) and Arkansas (8·1). They were highest in Arizona (14·2), New Mexico (14·1) and Florida (12·8). The death rates for the five most populous states were: New York (11·5), Pennsylvania (10·6), Illinois (11·0), Ohio (11·4) and California (12·5).

The death rate for the United States in 1939 was not far different from that in 1938; however, the figures for these years are only two-thirds of that prevailing at the beginning of the century, when the death rate was 17·6 per 1,000. According to current indications, the death rate for 1940 will be about as favourable as in the two previous years. In England and Wales, the death rate in 1939, namely 12·1 per 1,000, was somewhat higher than that for 1938 (11·6 per 1,000). According to the appended table, the death rates for England and Wales have hovered about 12 per 1,000 since 1920.

An analysis of the mortality statistics for the United States in 1938 according to cause of death showed the following ten rubrics to be the most important (the first figure shows the number of deaths and the figure in parentheses, the death rate per 100,000 population): heart disease, 350,168 (268·9); cancer, 149,214 (114·6); cerebral haemorrhage, cerebral embolism and thrombosis,

Annual Death Rates per 1,000 Total Population in Certain Countries for 1939 and for Each Year in the United States and in England and Wales from 1900 to 1939.

Country	Death rates per 1,000 in 1939	Year	Death Rates per 1,000	
			United States (b)	England and Wales
North America		1900	17.6	18.2
United States	10.6	1901	16.5	16.9
Canada	9.6	1902	15.9	16.3
Mexico	22.3	1903	16.0	15.5
South America		1904	16.5	16.3
Argentina	11.4			
Chile	24.6	1905	16.0	15.3
Colombia	17 3 (a)	1906	15.7	15.5
Uruguay	10.2 (a)	1907	16.0	15.1
Venezuela	19.3	1908	14.8	14.8
Europe		1909	14.4	14.6
Albania	15.1			
Austria	15.3	1910	15.0	13.5
Belgium	13.0 (a)	1911	14.2	14.6
Bulgaria	13.4	1912	13.9	13.4
Czechoslovakia	12.8 (a)	1913	14.1	13.8
Denmark	10.1	1914	13.6	14.0
Eire	14.2			
England and Wales	12.1			
Estonia	15 0	1915	13.6	15.7
Finland	12.4 (a)	1916	14.0	14.3
France	15.4 (a)	1917	14.3	14.2
Germany	12.3	1918	18.1	17.3
Greece	13.3 (a)	1919	12.9	14.0
Hungary	13.5			
Ireland, Northern	13.6	1920	13.0	12.4
Italy	13.2	1921	11.6	12.1
Latvia	13.9	1922	11.7	12.7
Lithuania	14.4	1923	12.2	11.6
Netherlands	8.7	1924	11.7	12.2
Norway	10.1			
Poland	13 8 (a)	1925	11.8	12.1
Portugal	15.5	1926	12.3	11.6
Rumania	18.6	1927	11.4	12.3
Scotland	12.9	1928	12.1	11.7
Spain	16.6 (a	1929	11.9	13.4
Sweden	11.5			
Switzerland	11.7			
Yugoslavia	15.6 (a)	1930	11.4	11.4
Asia		1931	11.1	12.3
India, British	24.3 (a)	1932	10.9	12.0
Japan	17.4 (a)	1933	10.7	12.3
Palestine	13.9	1934	11.1	11.8
Other Countries				
Australia	9.9	1935	11.0	11.7
Egypt	26.4 (a)	1936	11.6	12.1
New Zealand	9.2	1937	11.3	12.4
Union of South Africa (Whites)	9.4 (a)	1938	10.7	11.6
		1939	10.6	12.1

(a) Death rate for 1938.
(b) For years prior to 1933, the death rates relate to an expanding area within United States.

111,567 (85·7); influenza and pneumonia, 104,443 (80·2); i phritis, 100,520 (77·2); accidents 93,805 (72·0); congenital m formations and diseases of early infancy, 63,208 (48·5); tub culosis, 63,736 (49·0); diabetes, 31,037 (23·8) and arter sclerosis, 22,208 (17·1). These ten causes accounted for 78·9 of the deaths from all causes. There were 32,582 (25·0) mo vehicle fatalities included in the deaths from accidents.

In 1939, there were only 9 deaths of passengers carried scheduled commercial airlines in the United States; the date the last fatal accident in that year was March 26. A 17-mo period elapsed before the next disaster on a commercial airli this occurred on Aug. 31, 1940, and resulted in 25 deaths. Anot fatal accident on Nov. 4, 1940, caused the death of 10 persc Another on Dec. 4 also caused the death of 10 persons.

It is fitting to mention here the publication of a new *Man of the International List of Causes of Death as Adopted for in the United States.* This publication, issued by the bureau the census in 1940, is the fifth revision of the international of causes of death and is based upon the proceedings of the Int national commission held in Paris, Oct. 1938. The new man is used by state registrars of vital statistics, by the bureau the census, and by life insurance companies for the classificat of deaths according to cause of death.

The variation of the death rates per 1,000 in the United Sta for 1938 according to age, race and sex were as follows: a under 5 years, 13·8; ages 5 to 9 years, 1·3; 10 to 14 years, 1 15 to 19 years, 1·9; 20 to 24 years, 2·6; 25 to 34 years, 3 35 to 44 years, 5·7; 45 to 54 years, 10·8; 55 to 64 years, 21 65 to 74 years, 50·4; 75 years and over, 132·5. White males

all ages had a death rate of 11·3 per 1,000, while the rate for white females was 9·1 per 1,000. Among Negroes, the males had a death rate per 1,000 of 14·9 and the females of 12·7.

The expectation of life at birth corresponding to mortality conditions in the United States in 1938 was 62·12 years for white males and 66·20 years for white females. These figures are the highest yet recorded for the country. In the case of the white males, the gain in expectation of life at birth from 1901, the first year of record, to 1938 amounted to 13·89 years, while for white females, the gain was 15·12 years.

The gain in longevity since the beginning of the century is largely the result of substantial decreases in the incidence of the acute and infectious diseases. Thus, if the mortality conditions prevailing in 1901 had continued without change, about one-third of all babies born in that year would eventually have died from some acute or infectious disease; on the other hand, conditions in 1937 were such that only one-sixth of the babies would succumb to acute or infectious disease. Chronic disease would have claimed about one-half of the persons born in 1901, if the mortality picture of that year had remained unchanged; if mortality conditions of 1937 had kept constant, three out of every four persons born then would eventually die from chronic disease. The rise in the chances of eventual death from chronic disease is essentially a reflection of the diminished death rate from infectious (mainly acute) diseases unaccompanied by any comparable decrease in the death rates for chronic diseases, except that for tuberculosis. There has also been an increase in the chances of eventual death from external violence since 1901.

A classification of the deaths in the United States during 1938 according to the marital status at death showed that, among the males of all ages combined, the single numbered 216,489; married, 381,360; widowed, 139,737; divorced, 16,616; status not known, 10,700. Among the females, the number single was 141,445; married, 231,387; widowed, 233,070; divorced, 8,441; status not known, 2,146. It has been estimated that, among the married men who died within the year, about one quarter, or about 100,000 left widows at ages under 45; another quarter left widows at ages 45 to 54; a third quarter, at ages 55 to 64; and the last quarter, at ages 65 and over. (*See* also CENSUS, 1940.)

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(A. J. Lo.)

Debts, Government: *see* NATIONAL DEBTS.

Declaration of Panama: *see* HISPANIC AMERICA AND THE EUROPEAN WAR; INTERNATIONAL LAW.

Defence, National. The year 1940 covered the beginning of the most profound and far reaching developments in U.S. military and naval policy which had been seen in more than 20 years, that is, since the end of the World War in 1918. Some of those developments were important steps forward, some held promise of being such steps, and some were of very uncertain value. The evaluation of any military or naval policy must be made in relation to the military needs and the foreign policy of the nation concerned. It is essential therefore to begin this review of U.S. military and naval policy with a highly summarized study of U.S. foreign policy and the national problems arising out of that policy in dealing with other nations.

The dominant factor of that policy throughout 1940, and particularly as the year ended, was the war in Europe, and to a less but still important extent, the war in Asia between Japan and China, with its minor offshoot, the Thailand invasion of French Indo-China. At the opening of 1940 the war in Europe had fallen into a state of almost complete inactivity, except for the blockade activities of the belligerents. This period of stagnation encouraged the illusion in the U.S. that it would not be difficult for the United States to continue its neutrality. While sentiment favoured the allied powers (Great Britain and France), it was generally felt that their eventual victory over Germany and its still non-belligerent axis partner, Italy, was reasonably certain.

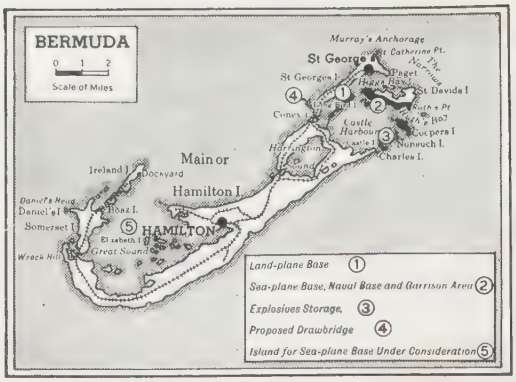
By the end of the year 1940 France had surrendered to Germany; Italy had become an active belligerent; Great Britain was desperately defending itself from savagely destructive air raids on its greatest cities; while it was being officially admitted by its most highly placed spokesmen that its hope of victory rested largely on very substantial aid from the United States; five sovereign nations of Europe had been completely overrun by Germany, two of which, besides France, had territorial possessions in the western hemisphere; Greece had been invaded by Italy without provocation, but had inflicted severe defeats on the Italians and had in turn invaded Italian Albania; and Japan had formally joined the Rome-Berlin axis and had adopted an openly hostile attitude to the United States and Great Britain in the western Pacific and the far east.

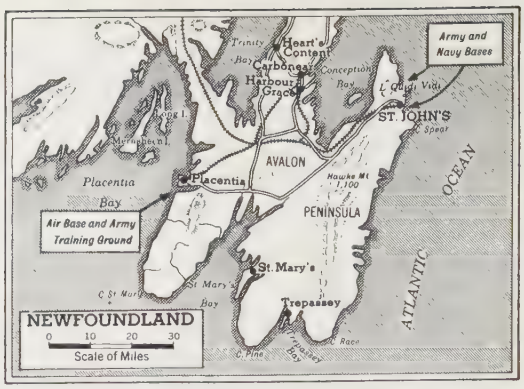
These events had shattered the happy illusions of safe isolation from the deadly problems of a revolution-swept world. From a comfortable tradition, the Monroe Doctrine had become a matter of grim concern, none too covertly challenged in the summer of 1940 by the foreign minister of victorious Germany and repeatedly sneered at and satirized in the officially controlled press of all three axis allies. The sudden hostility of Japan and her threats to move southward into the Dutch East Indies and French Indo-China, imperilling important U.S. economic interests, had driven home to the American nation the realization that, in the event of a British defeat, the three axis powers could mobilize for attack in both oceans combined naval forces greater than those possessed or in early prospect of possession by the United States.

In a vigorously contested presidential election, the two principal candidates, President Franklin D. Roosevelt (Democratic) and Wendell L. Willkie (Republican) agreed that U.S. interest required giving all possible aid to Great Britain to prevent its defeat. Within a few weeks after the American people had re-elected Mr. Roosevelt to a third term as president, he dropped all reservations that such aid should be "short of war." On Jan. 16, 1941, Mr. Willkie in an unscheduled extemporaneous statement at the Town Hall in New York strongly endorsed the main premise of the president's foreign policy. The so-called "isolationists" were still numerous and vocal, but the nation generally and soberly realized that the tide was running ever more strongly toward involvement in war for stakes vital to the continued existence of the U.S. republic.

The defence problems which these developments brought before the American people came as a great shock to the majority of them. They did not, however, present any basic problems which were new to the professional officers of the U.S. army and navy. To them the situation, suddenly become acute, rendered more vividly urgent many matters which had long been known to them, but with which inadequate public support had prevented them dealing.

From a purely military viewpoint, the isolationists insisted that the two oceans were still barriers to invasion of the U.S., a view which they stressed as months passed and the Germans did not succeed in crossing the narrow seas to a successful inva-





LEGEND

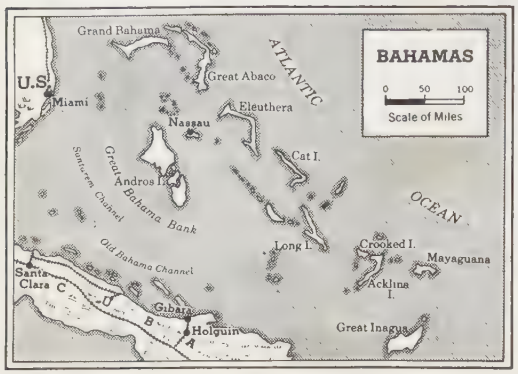
Railroads

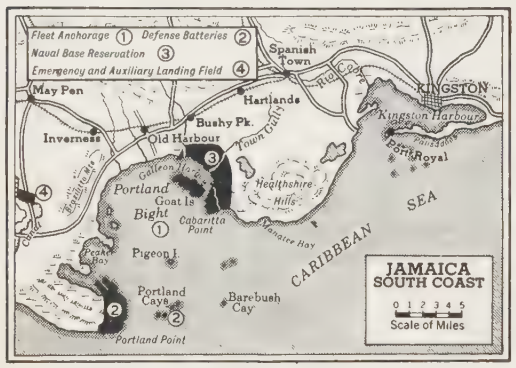
Highways

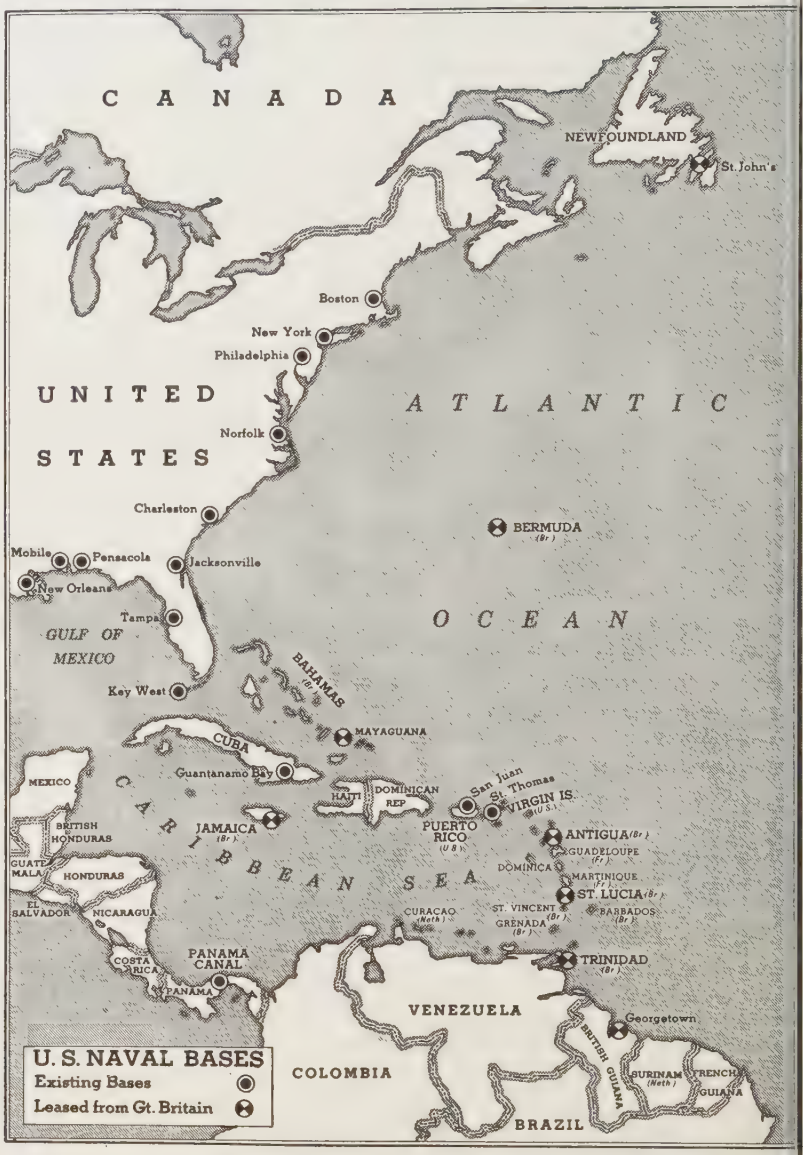
This page is designed to illustrate the sites of the United States land-plane, sea-plane and naval bases acquired from Great Britain under the agreement of September 3, 1940, as decided upon by the end of 1940.

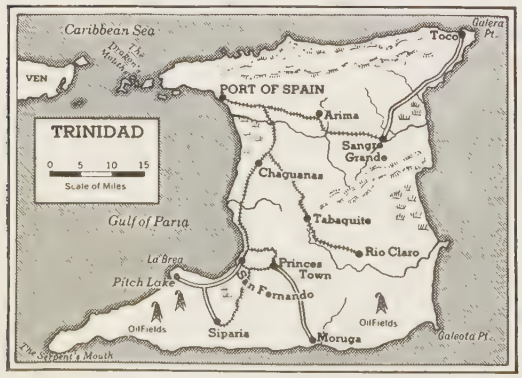
The selection of sites in the Bahama Islands and Trinidad remained undecided at the close of 1940.

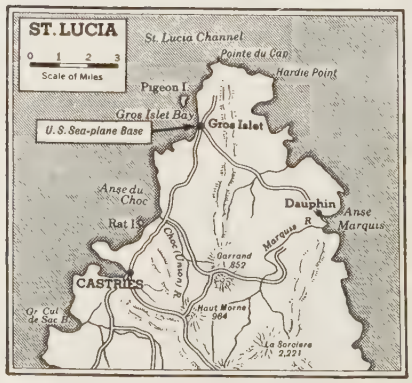
C. S. HAMMOND & CO., N. Y.











sion of England. The naval men answered that Britain was, nonetheless, paying a fearful price to air attack for her long unpreparedness and that the narrow seas would have done Britain little good had it not had a powerful navy to repel attack across those waters. Even Britain's mighty naval power was being strained to the limit, possibly dangerously beyond it, to patrol those narrow seas and also to keep its sea borne commerce moving. In short, while it was evident that the U.S. first line of defence was still naval, it was naval and not merely aqueous.

In this connection frequent reference was made to the danger of blind reliance on a broad expanse of ocean, as the French had relied, to their complete disaster, upon the Maginot line. The navy must be powerful enough to meet all possible attack, and now, what had been an extreme naval hypothesis (naval attack on both the Atlantic and the Pacific oceans) had become a live possibility and an almost avowed plan.

Numerous other phases of the U.S. naval problem arose, minor only in relation to the main issue of preserving the mainland of the United States from invasion, but each of them a problem capable of testing U.S. naval strength to the full. The more or less loosely observed codes of international law which had guided the three centuries of the modern epoch had been brazenly thrown over by the totalitarian powers, the new probable enemies of the U.S., acting in concert. There was no assurance that they would even content themselves with a formal mass invasion directly across either or both oceans, with diversions on the other. The problem of transporting a great army across the ocean, even granting German victory in Europe, was still stupendous and, by itself, could probably be frustrated by the U.S. navy, although possibly only by abandoning its far eastern interests to Japan and taking grave risks as to Hawaii, the Panama Canal Zone and the western coast of the United States.

There was also the danger that utilizing that highly co-ordinated combination of treachery, espionage, sabotage, internal subversion and political and economic corruption and blackmail, which had come to be known as the "fifth column," the enemy might establish a formidable bridgehead and base of operations on the South American continent. From Brazil to Dakar in West Africa the ocean voyage would be much shorter than across the north Atlantic, but, more important, it would be remote from U.S. air and sea bases. Here was a combined naval-military expeditionary force problem and political-economic problem very definitely related to the defence of the United States. Again, just as aid to Great Britain was regarded as the most immediately effective way of impairing the war might of Germany and Italy, so aid to China was regarded with relation to Japan. Yet, to reach either Great Britain or China with U.S. aid, control of the sea lanes was essential.

Another problem arose in the Pacific with regard to the Netherland Indies, Australia and New Zealand. Joint use with the British of the great British naval base at Singapore could add enormously to the power of the U.S. fleet in the Pacific. However, the use of that base by either British or Americans would be seriously impaired by any important Japanese advance southward into the area of French Indo-China, Thailand (Siam), the Netherland Indies or Australia. To give greater point to this peril, as 1940 closed, it became evident that German commerce raiders were operating in the Pacific and Indian oceans, probably with at least tacit Japanese aid.

It was frankly admitted by the highest U.S. naval authorities that the U.S. navy was not ready to meet all these problems. This raised the possibility of direct invasion, if not of the United States, then certainly of other areas on the American continent. This in turn brought to the fore the extent of the military establishment needed to deal with such invasions, and to furnish expeditionary forces to meet such threats elsewhere on the continent. It raised very urgently the problem of U.S. air power to play its part in repelling all such invasions anywhere on the western continent. Finally, there arose the psychological problem that defence of the U.S. might rest ultimately on ability to launch a powerful U.S. offensive.

Lack of a Co-ordinated National Defence Policy.—Recognition of these varied problems of national defence brought on a veritable high fever of preparation—raising troops, equipping them, building ships and equipping them, setting up of industrial priorities to expedite contracts for national defence matériel, raising or at least appropriating colossal sums for these various purposes. Notwithstanding all these intensified activities, there was little evidence that the most fundamental weakness of the U.S. defence scheme was being remedied, or indeed that it was even receiving serious attention.

That fundamental weakness was the lack of a comprehensive, integrated U.S. military, naval, foreign and economic policy, and particularly the lack of a definitely constituted body charged with the sole duty of developing such a policy and keeping it effectively up-to-date, such a body as the British had in the Committee of Imperial Defence. Numberless examples of ineptitude had developed, directly traceable to the absence of such a body. The nation found itself seriously contemplating the possibility of war with Japan, arising out of conditions which had been developing over a period of from nine years to six months. Yet, for a considerable part of that time, indeed, until Japan had actually joined the axis powers in formal alliance, the United States had been permitting the shipment of substantial war material, such as pig iron, scrap iron and cotton to Japan.

A world situation which had been steadily building to the climax at which 1941 opened, and which had been developing through three years of war in Asia and nearly a year of war in Europe, found the U.S. in May of 1940 suddenly almost hysterical over the dangers arising from a possible axis victory in Europe. A foreign policy had been pursued for several years which was bound to antagonize one or more of the axis powers in Europe and Asia, while the military policy had retrograded almost to a pre-World War (1914–18) status.

With enormous naval responsibilities piling up, nothing substantial was added to the main battle line of the navy or to the essential destroyer support of that line until after the Japanese actually discarded the naval limitation treaties and laid down substantial building programs. The well known development of the German *Panzerdivisionen* was amiably ignored until the Polish and French disasters found the entire U.S. army with less mechanized equipment of all types and ages than was to be found in a single *Panzerdivision*. This was all the more remarkable in that the German staff was indebted in large measure to U.S. army studies of the use of mechanized forces in modern war for the basic ideas which the Germans developed to such perfection.

From what has been said previously, it is evident that the American military problem was pre-eminently a naval problem, and that the navy, although in far better shape than the army, was not adequate to deal with all aspects of that problem. Moreover, one of Britain's urgent needs was reinforcement of merchant marine and naval strength, especially in the destroyer and patrol vessel classes.

Yet so little had this problem been seriously dealt with that the secretary of the navy on Jan. 17, 1941 put before the Foreign Affairs committee of the house of representatives a comparative tabulation of naval strengths which showed United States combatant tonnage, as of Jan. 1, 1941, to be 1,250,000 tons, compared with a combined tonnage of Germany-Italy-Japan of 1,835,000 tons, to which the remnants of the French fleet might add 310,000 tons. These figures showed marked and increasing inferiority in numbers of battleships, cruisers and submarines and a continuing but shrinking inferiority in numbers of destroyers for the U.S. fleet, as compared with the axis fleets (excluding France) through to Jan. 1, 1943. By this time it had been found that U.S. shipyard capacity was unequal to the task of meeting the urgent demands of the navy, ordinary merchant ship requirements and the very urgent merchant ship demands of the British. Since this situation had been foreseen and publicly commented on by private observers months before, this serious handicap was reasonably chargeable to the lack of a co-ordinated defence planning program.

Faced with this great naval construction and equipment problem, with its inevitable burden on the machine tool and precision metal working branches of industry, a huge army program was launched in the early fall of 1940. A movement initiated by private patriotic groups was adopted as government policy and resulted in passage of a Selective Service act, which contemplated putting 1,400,000 men under arms by the summer of 1941. The details of this plan are dealt with under SELECTIVE SERVICE. But the equipment of this gigantic force threw another load on an already overburdened industry.

Numerous procurement difficulties within the army program arose immediately, of which there is space to cite only one. Two mechanized divisions were authorized by the war department, with insufficient equipment for one on hand. It was found that to supply the necessary tanks or combat cars it would be necessary to erect a factory. It was found that it would take possibly one year before that factory could be erected *and equipped* to begin production of the basic equipment for the mechanized divisions. Yet for years the army had been working on an industrial mobilization plan.

A similar situation arose in aircraft procurement. Whereas in May 1940 the president had spoken of 50,000 planes by Jan. 1941, production of 799 planes of military type in Dec. 1940 was being hailed as exceeding expectations. (Statement of John D. Biggers, director of production for Office of Production Management, headed by William S. Knudsen.) Mr. Biggers was unable to state how many of these represented first line combat planes, and he declined to discuss what proportion would go to Great Britain and how many to U.S. combat aviation. Woefully inadequate as the British air strength was, the effect of planning was shown in the enormous step-up in their production, notwithstanding destructive German bombing of British industrial centres.

In considerable measure this was attributed to the so-called "aircraft shadow factories," planning for which had begun as far back as 1933, the year Hitler came to power. There was no evidence to indicate any comparable U.S. planning much before the summer of 1940.

In one other respect the lack of an integrated plan was evident principally to close, technically trained observers, familiar with the propaganda techniques of modern warfare. The new so-called "fifth column" tactics of the German army had rendered striking assistance in their European

conquests, and had been defeated in England only when the eleventh hour was striking. These tactics differed in each country where used, and it was evident and known to close observers, inside and outside the U.S. armed services, that the plan for attack on the United States was adapted to strike along propaganda and economic lines.

This was outside the classic lines of war as visualized by the U.S. high command. Even if it was not so regarded, neither the army nor the navy was equipped with machinery to wage a counter to this form of attack. Yet a properly integrated policy of defence would have foreseen this development, or at least would have recognized it as soon as it appeared and set in motion a direct counterattack in defence. As it was, such effort as was made was largely the unco-ordinated, often the friction-creating work of rival legislative committees and executive departments and private agencies, all open to the suspicion of and often charged with working for ulterior political, private or propaganda purposes. This situation alone represented an actual victory on this front for the German agents, who sought primarily to confuse and break up the unity of American purpose. The question of aid to Great Britain, fundamental to the nation's major strategy, thus became a football of these internal bickerings, rather than the measured, confidence-inspiring decision of a "Committee of National Defence"—which did not exist.

American Aid to Great Britain.—More than any single phase of defence policy, this question of aid to Great Britain became a measuring rod of the extent and direction and nature of U.S. foreign and military policy. Originally arising as an admitted successor to the waning notion of neutrality in the war in Europe, it was first epitomized in the words "all aid short of war." The high point of this phase was reached when the president of the United States announced on Sept. 3, 1940 the conclusion of an agreement between the United States and the British governments whereby the latter had given to the former the right to air and naval bases in Newfoundland and Bermuda, and in exchange for 50 over-age U.S. destroyers turned over to the British, the British government had conceded to the United States government the right to additional bases in the Bahamas, in Jamaica, Saint Lucia, Trinidad and Antigua and on the South American mainland in British Guiana.

This transaction, carried out exclusively by executive action (the American congress merely being notified by the president that he had so acted), gave the British fleet a reinforcement in destroyer strength which it desperately needed for convoy and anti-submarine work. On the other hand it gave to the U.S. fleet vital bases offshore of the United States mainland and at the entrances to the Caribbean sea which enormously increased the navy's offensive and defensive powers on the Atlantic seaboard. Winston Churchill was criticized in England for having paid too high a price for the destroyers, a rather pointless criticism in view of the very serious British naval position. In the United States, even the president's critics recognized he had done well for U.S. defence and merely criticized his methods.

Great as was the strategic importance of this destroyers-for-bases deal, its significance as a milestone in U.S. policy was still greater. When the policy of aid to Great Britain went so far as to turn over 50 serviceable warships, it became very vague as to what limitation, if any, actually existed in the phrase "short of war." As has already been said, shortly after election this phrase disappeared from public discussion, except for a relatively feeble attempt to revive it in Jan. 1941 when opponents of the president's "lease-lend" policy adopted the previous formula as their own, thereby tacitly conceding victory to his view, since it now represented a considerable recession from their own original view of absolute neutrality.

The bigger question arose—how far shall aid to Great Britain go, in light of United States defence needs? The president ordered that the duction of United States aeroplane factories be liberally shared with British—no exact formula was ever officially published. But the Un States needed great accessions to both its air force and its own n Those favouring liberal aid argued that the British were now fighting common enemy; made strong enough they might defeat that enemy w out imperilling the United States or engaging her armed forces. Implici this view was the premise that Great Britain could defeat Germany might not. In that eventuality, even extending to a British disaster, United States might have to fight the entire axis strength dominating of the rest of the world. Then every ship and plane would be of vital portance to the United States.

Naturally this last argument led its proponents to the conclusion that should be carefully rationed. Unfortunately, a realistic view stro suggested that this line of reasoning, like the theory that the United St should give aid which "did not inevitably lead to war," would be likel result in British defeat and thereby leave the United States facing a the alternatives of accepting hostile axis domination of the world or with the axis powers. The really practical problem appeared to be: I much aid could the U.S. afford to give Great Britain, recognizing that e month of assistance enabling it to prolong its fight both injured the en and gained very much needed time for building up U.S. defences to point where the United States could risk collision with the axis wit reasonable chance of victory?

Obviously this problem involved several constantly shifting varia each acting on the other factors in the problem and changing their va in the equation. It was a problem which could not be solved categoric or definitively and most certainly could not be solved by *a priori* discuss It was, in short, a problem of high policy and therefore one of judgm constantly adapting itself to the changing exigencies of the situation.

Only one element emerged with reasonable clarity and secured virtu unanimous support—the United States must carry all its preparations war to the full extent of its resources by sea, air and land, in industry in morale, even to the extent of being ready to wage powerful aggres war as the surest ultimate defence. This was being done.

Development of American Naval Strength and Policy.—Although annual budget presented to the congress at the beginning of 1940 inclu $1,800,000,000 for defence purposes out of a total proposed expendi of $8,400,000,000, a defence budget which was quite heavy for peacet the real upturn in defence items did not begin until May. During month of May the congress authorized or appropriated a total of m than $5,000,000,000. By July these figures were virtually doubled.

The authorizations, as distinct from appropriations, looked to fu growth beyond the fiscal year 1940–41, and this was particularly true the navy, the programs for which contemplated building extending ove six-year period. It having been recognized that the navy, in the even British defeat, might be called on simultaneously to meet aggregate fo exceeding its own strength in both oceans, a "two-ocean" navy was aut ized. Under this concept the navy would no longer have to rely tacitly British support to control the Atlantic, while it devoted itself mainly to Pacific; nor would it matter so vitally if some attack on the Pana canal prevented rapid transfer of the fleet from one ocean to meet att in the other. The theory of the "two-ocean" navy was that this f could permanently maintain in each ocean a force adequate to meet anticipated attack in that ocean.

To attain this new ideal of a two-ocean navy, a 70% increase above strength hitherto contemplated was authorized. As this included building of a number of large battleships, as well as the appropr

NEW 155-MM. FIELD GUN, given its first trial by the U.S. army in 1940. It fires a 95-lb. shell 26,000 yards

ighter vessels, increase in the air force and in shore establishments to service such a fleet, the authorizations covered items some of which would ake until 1946 to complete.

Early in Jan. 1941 two other announcements showed the energy with which the navy was addressing itself to immediate plans and efforts to ncrease its fighting strength. It was announced that the enlisted personnel of the navy would be increased to 232,000 men, an increase of approximately 22%. It was also announced that the navy was being reorganized nto three fleets—Atlantic, Pacific and Asiatic. The last named indicated he beginning of definite plans to meet anticipated Japanese southward aggression toward Singapore and the islands of Netherlands India—an almost revolutionary step in U.S. naval thinking.

In his budget message accompanying the budget submitted to the congress or the fiscal year beginning July 1, 1941, the president spoke of the $10,811,000,000 as only part of a three-year program, in the course of which total naval expenditures were expected to reach $11,587,000,000, quite aside from nearly $3,200,000,000 set aside for increasing industrial plants to take care of increased defence needs.

By Jan. 1941 it was estimated that 21 new warships and a much greater number of auxiliaries had been added to the fleet, and that approximately one fighting ship was being delivered every 12 days.

Ships take time, a great deal of time, to build, and it also takes considerable time to train naval crews adequately to their multifarious and highly technical duties. But battle fleets require more than ships, guns and men. They also require bases from which to operate, and the far-flung system of naval bases girdling the world was one of the greatest elements of strength available to the British fleet. A considerable step in building up the U.S. navy was taken by the acquisition of lease and other rights to bases on British territory in the western hemisphere, already discussed in connection with the delivery of 50 American over-age destroyers to the British. Other negotiations were undertaken with various South American nations looking to the availability of suitable air and sea bases of operation on that part of the western continent. While progress was apparently made, up to Jan. 1941 no official confirmation was made available regarding the progress of such negotiations.

Development of American Army Strength and Policy.—By its nature the army was much more susceptible of rapid expansion, clearly evident and close to the citizens of the republic than was the navy. While the army was undergoing an expansion which seemed to be somewhat out of line with its probable immediate responsibilities, it is entirely possible that the president saw in the continuing expansion of this side of the nation's armed forces the means of keeping public attention focused on the defence problem, from which it might have been distracted if left only the comparatively technical and slow-moving naval development to watch.

Whatever reasons of high state policy might have played their part in the decision, the U.S. army was undergoing a tremendous expansion in numbers and equipment, although the greater part of the actual increase in size was planned for 1941. The outstanding change in the army picture was the passage of the Selective Service act. While a somewhat similar act had been in force in the United States in 1917, the nation was then formally at war. This was the first time a conscription measure was in force in the United States during a period of nominal peace. The increase in the man power of the army was, however, in part due to volunteers. In June 1940 the army strength stood at about 240,000. Six months later the number had risen to approximately 600,000.

Camps and cantonments to accommodate a force of 1,400,000 men were well advanced toward completion. During the six months the number of new Garand semi-automatic rifles increased from about 40,000 to over 100,000. The step-up in production of these rifles was beginning to exceed the best early hopes. The internal system of army administration was undergoing considerable revamping, both to take care of the large numbers of new soldiers coming to the colours and also to permit actual modern battle training for large bodies of troops, such as had not been seen together in this country since 1918. The nine corps areas were assuming their wartime function of administration, procurement and recruiting, while the tactical training was being taken over by the four armies, which had previously been largely paper organizations erected upon groups of corps areas.

Air Force Policies and Development and Industrial Production.—At the beginning of the year 1940 it was stated that the army had almost no aircraft equal to the warplanes of the warring nations in Europe. By the year's end it was estimated that the army had about 500 first-line planes, besides several times this number of obsolescent and training type planes. About 400 planes had been added to the navy and marine corps aviation, bringing it to a total of approximately 2,500 planes. Of course these numbers were relatively insignificant by comparison with the forces in service in Europe.

The American increase would have been much greater had it not been for the considerable part of U.S. production which was diverted to supplying the British needs. And this, in turn, drew attention to the whole industrial production set-up. The president called to Washington a commission of outstanding industrial leaders to co-ordinate production. This group was, however, advisory and without authority. There still prevailed, even in this one phase of the national defence, that marked reluctance to a centralized co-ordinated plan which has been previously spoken of as the major defect of the U.S. defence set-up. By November it was becoming painfully evident that this commission, in spite of heroic labours by its members, was not getting production.

The president at the beginning of 1941 set up a new Office of Production Management under the co-directorship of William S. Knudsen, formerly president of General Motors corporation, and Sidney Hillman, an outstanding labour leader. The magnitude of the industrial task was indicated by the fact that, over and beyond writing into the internal revenue acts certain provisions for the amortization and depreciation of equipment used in filling national defence contracts, the government also made provision for directly financing the construction of industrial plants in which to manufacture the equipment needed by the armed forces. It was estimated that the government's direct investments of this nature might total $3,000,000,000 before the emergency was under control.

In the industrial end of the problem appeared the first glimmer of hope of co-ordinated organization. It was felt that industry and labour, even at the opening of 1941, were still imbued with the "business as usual" viewpoint. But the ceaseless pressure of the Office of Production Management (OPM) began to undermine this easy complacence. The absolute shortage of industrial equipment to fill all the orders of all the armed services and of the British, made imperative some form of centralization, of priorities control and of rationing production capacity. Inevitably this required some formulation of a comprehensive plan and policy. As 1941 opened and the nation was plunged into debate over the president's sweeping proposals for almost unlimited executive authority over the nation's war effort in every field to be vested in the president, the idea of a co-ordinated plan was securing tacit, vague, but increasing recognition. Out of the urgent necessities of *de facto* war, through the industrial back door to the theatre of war, the idea of a co-ordinating authority was slowly taking shape. It was too late to make it function economically; there was still time, but not much time, to put it in sufficient shape to function effectively. (*See* also ADVERTISING: *U.S. Army Advertising;* BUILDING AND BUILDING INDUSTRY; EDUCATION; FINANCIAL REVIEW; HISPANIC AMERICA AND THE EUROPEAN WAR; HOUSING; MUNICIPAL GOVERNMENT; NATIONAL GUARD; NEUTRALITY; TENNESSEE VALLEY AUTHORITY; UNITED STATES: *National Defence;* LEGISLATION: *Federal;* LIBRARIES; PUBLIC UTILITIES. Also *see* under the various countries.) (G. F. E.)

De Gaulle, Charles: *see* GAULLE, CHARLES DE.

Delaware, one of the 13 original states, popularly called the "Diamond state." Area, 2,399·2 sq.mi. (land, 1,961·7; water, 437·5). Population (1940), 266,505. Capital, Dover, 5,517. The only larger city is Wilmington, 112,504. Public school attendance (Sept. 1940), 41,849.

History.—In the November elections 51·1% (fourth highest in nation) of Delawareans voted. Roosevelt, 74,599; Willkie, 61,390. The third-term candidate, with a big lead in Wilmington, smaller (about 10%) pluralities elsewhere in the state, carried the Democratic congressional nominees and all state administrative officers, except governor, with him to victory. James M. Tunnell, Sr., and Dr. Philip A. Traynor displaced Republican Senator John G. Townsend, Jr., and Representative George S. Williams (pluralities, 4,495, 3,821). With holdover Senator James H. Hughes, Delaware's Washington delegation became wholly Democratic for the first time since 1919. However, the Republicans retained control of the state legislature (senate 10–7, house 21–14) and recaptured the governorship. Popular Democratic Governor Richard S. McMullen, slated to succeed himself, was compelled by poor health to withdraw on the eve of the election. His successor, youthful Secretary of State Josiah Marvel, Jr., was snowed under by Republican Mayor of Wilmington, Walter W. Bacon (70,809 to 61,276). The Democrats elected Isaac J. MacCollum lieutenant governor by 656 plurality, other state offices by safer margins. A last-minute Liberal Democratic ticket polled 2,000 to 3,000 votes.

GOVERNOR WALTER W. BACON of Delaware, elected Nov. 5, 1940 on the Republican ticket

A $1,500,000 addition to the Delaware hospital, Wilmington, was completed in December. The second unit in the hospital's $3,500,000 building program was under construction; the third will be begun in 1941. In December the Biochemical Research foundation of the Franklin institute (Philadelphia) moved into new quarters adjoining the university campus in Newark. Equipment (including cyclotron) and building were valued at $500,000. The federal food stamp plan for the distribution of surplus commodities was inaugurated in New Castle county in November.

Headquarters of the U.S. 2nd army corps were established in Wilmington in December.

Industries.—National defence spending added impetus to the general improvement in Delaware business in 1940. In November employment was up 6·6%, payrolls 13·9%, over Nov. 1939. In Wilmington, building permits for 1940 totalled $6,698,334 (1939, $5,470,655). General business was better in 1940 than in 1929, according to Babson, who at the year's end called the Delaware metropolis "one of the most prosperous cities of the country." Principal Delaware crops were estimated at $10,836,000, 13% above 1939. Higher yields offset lower prices. Delaware, with 0·2% of the nation's population, paid 1·5% of the federal tax bill for the fiscal year 1940. Average per capita income (1939) was $848, highest in the country (New York, $825, second; national average, $536). Of Delaware personal income, invested capital contributed 39% (national average was 16%). For the fiscal year 1939 federal tax collections averaged $275 per capita, expenditures $26.

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Delaware River Aqueduct: *see* AQUEDUCTS.
Dementia Praecox: *see* PSYCHIATRY.

Democracy is not only a technique of government, based upon freely elected representative institutions and upon an executive responsible to the people; it is based upon the belief in the equality of all individuals and in their equal right to life, liberty (including the liberty of thought and expression) and the pursuit of happiness. The denial of this equality and of individual liberty, the proclamation of authoritarianism and of the inequality of men and races as a "new order," is characteristic of fascism, which arose as a conscious and aggressive world-wide opponent of democracy, bent upon its destruction.

The events of the war in 1940 brought with them the occupation and the defeat of five of the leading European democracies: Denmark, Norway, the Netherlands, Belgium and France. In all these five countries fascism replaced democracy, at least outwardly; most of the inhabitants of Norway and the Netherlands and the legitimate governments of those two countries clung firmly to their democratic principles and looked forward to a defeat of the fascist powers as their only hope of regaining liberty. The same may be said for the majority of the people in Denmark, in Belgium and even in France, although there the defeat and the ensuing chaos were used by a group of reactionary and antidemocratic politicians and generals to establish a semi-fascist regime and to abolish the democratic institutions of the French republic.

In the two remaining democracies on the European continent, the spirit of democratic resistance was rather strengthened by the events of the war. The parliamentary elections held in Sweden on Sept. 15, 1940, bore that out clearly. As compared with the last elections in 1936, the new elections proved a definite trend toward more democracy. The National Socialists who in 1936 had received 26,750 votes, too few to get a seat, did not participate at all in the 1940 elections. The Communists received only three instead of the five seats of the former elections, while the largest democratic party, the Social Democrats, gained for the first time the absolute majority in parliament and could increase the number of its seats from 112 to 134. On the other hand, the Conservatives lost two seats, the Liberals four and the Agrarians eight. Thus the election strengthened the Social Democratic government. There were no elections in Switzerl but an interesting indication of the strength of democracy afforded in the general protest movement in parliament, in press and among the people against the audience which the fec president had granted to the representatives of the "Nati Movement," a Swiss National Socialist group. The federal c cil was obliged to stress the will of resistance of the Swiss gov ment to any encroachment on Swiss democracy. A short w later, when the National Movement presented an ultimatun the federal government, demanding recognition and permissio publish fascist papers, the government not only refused the mand but dissolved the movement and threatened its leaders imprisonment.

On the whole, fascist and communist attacks against democ led to a reappraisal and a reassertion of the fundamental tudes and truth inherent in the democratic position. This bec especially clear when the democratic peoples learned to appr after the fall of France, the whole military power of the fa countries and began to realize the danger to their exist implicit in a German victory. A new will to democratic animated the British and the American peoples. The heroic s taken by the British after May 1940, under the governmen Winston Churchill and of the British Labour party, the int democratization of the spirit and forms of British life which war brought with it, acted as an inspiration to democratic f and hopes everywhere. In the United States people begar understand the seriousness of the life-and-death struggle in w democracy found itself, against a world-wide attempt to im fascist domination. Public opinion swung rapidly to demands a total defence of the democratic institutions of the United St and for all aid to Great Britain short of war. Both great poli parties and their leaders made these demands part of their gram. The formation of an alliance of the three great fas powers, Germany, Italy and Japan, which was openly aimed at United States, hastened the realization by the American pe of the fact that only a united stand of the democracies c stem the tide of fascist aggression. Various proposals fo federation of the democracies and for the establishment of tems of mutual assistance for the preservation of internati order were put forward and gained large numbers of adhere A new will became manifest, to apply democracy to the in national field, to overcome national egotism and thus not only make peace possible but to make democracy secure interna The conquest of Norway, of the Netherlands, of Belgium France revealed the existence of well-organized pro-fascist gro in those countries, the so-called "fifth columns," which un mined the will to resistance of the democracies, helped to spr mental and moral confusion about the issues of the war sabotaged national defence. The clear revelation of the existe of these groups focused the attention of the remaining demo cies upon the danger from within, and with increased vigilance necessary steps were taken to combat this danger.

This growth of democratic awareness made itself felt also Latin America. The strong stand taken by the United States the defence of democracy and especially the continuance of British resistance to fascist aggression influenced many of vacillating elements in the Latin-American republics and c vinced them of the strength of democracy. With the unexpec vigour of British defence and the courageous stand taken by Greeks as an example, the Latin-American governments were rea to co-operate with the United States in the common defence the western hemisphere, not only against external aggression also against internal disintegrating anti-democratic forces. M ico and Uruguay, especially threatened by fascist intrigues, ca closest to full co-operation with the United States. (*See*

COMMUNISM; FASCISM; FRANCE; GERMANY; GREAT BRITAIN; ITALY; JAPAN; PACIFISM; UNITED STATES; UNION OF SOVIET SOCIALIST REPUBLICS.)

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Democratic Party. As 1940 opened, the Democratic party continued in control of the executive and legislative branches of the national government. When the 76th congress convened for its third session on Jan. 3, the Democrats held 69 senate and 261 house seats. Postmaster General James A. Farley remained as chairman of the Democratic National committee. In the house, William B. Bankhead of Alabama held office as speaker, with Representative Sam Rayburn of Texas as floor leader. Senator Alben W. Barkley of Kentucky continued as Democratic senate leader.

The war emergency greatly strengthened the president's leadership in congress. In 1939, reflecting the conservative trend of the 1938 elections, many Democrats in congress showed a more critical attitude toward the New Deal. National defence, and the European war, dominated the proceedings in congress in 1940. Though the Democrats were still sharply divided on many domestic issues, the president easily secured enactment of his defence measures. The administration proposed little new social legislation of importance.

Though the president remained silent as to his 1940 intentions, the third term question was much discussed by Democratic leaders. Many high administration officials urged that the president be drafted for another term. Other Democrats let it be known that they would oppose a third term.

The Election.—On Feb. 5, under call of Chairman Farley, the Democratic National committee met in Washington, and authorized Chairman Farley and a small committee to fix the date of the national convention and select the convention city. In accordance with this authority, Chairman Farley later issued a call for the Democrats to meet at Chicago, on July 16.

Regardless of Mr. Roosevelt's plans, Vice-President John Garner announced that his name would go before the convention. In the Illinois primaries on April 9, the president defeated Mr. Garner by a majority of approximately 6 to 1. Postmaster General Farley, another aspirant for the nomination, permitted the use of his name in the Massachusetts primaries. By the end of May, however, it was plain that the president could have his party's nomination, if he would accept it.

On June 20, the president nominated Frank Knox and Henry L. Stimson, Republicans, to be secretary of the navy and secretary of war respectively. The nominations came under immediate attack in the senate. Democratic "isolationists" charged that Stimson and Knox both favoured United States intervention in the European war. Republicans asserted that the appointments had converted the Democratic party into a "war party." Both nominations were confirmed, that of Stimson on July 9, by a vote of 56 to 28, and that of Knox, the following day, by 66 to 16.

Speaker Bankhead, as temporary chairman, delivered the keynote address at the Democratic National convention. Senator Alben W. Barkley served as permanent chairman. On July 18, President Roosevelt was renominated on the first ballot for a third term. By a vote of 628 the convention selected Secretary of Agriculture Wallace as his running mate; Speaker Bankhead received 329 votes, and Paul V. McNutt, 67 votes. Both were candidates for the vice-presidential nomination. Postmaster General Farley, who had been placed in nomination at the convention by Senator Carter Glass of Virginia, resigned as chairman of the

DEMONSTRATION for President Roosevelt during the historic third-term convention of the Democratic party at Chicago in July 1940

Democratic National committee in August and the president announced the appointment as his successor of Edward J. Flynn of New York. Democratic national headquarters were moved for the duration of the campaign from Washington to New York.

On Nov. 5, President Roosevelt was re-elected by 449 electoral votes to 82 for the Republican candidate, Wendell L. Willkie. Though the Democrats lost five senate seats, they increased their representation in the house.

On Sept. 15, Speaker William B. Bankhead died. The following day Representative Sam Rayburn of Texas was elected to the speakership, and on Sept. 25, a Democratic caucus chose Representative John W. McCormack of Massachusetts to succeed Mr. Rayburn as majority leader of the house. Senator Key Pittman of Nevada, chairman of the Senate Foreign Relations committee died on Nov. 10. He was succeeded as chairman by Senator Walter F. George of Georgia.

Though administration leaders pressed for a *sine die* adjournment, their efforts were blocked by the Republican minorities in congress, and the 76th congress remained technically in session through the calendar year 1940. On Dec. 29, Mr. Roosevelt made a radio address, in which he announced that the United States would become "the arsenal of democracy." As the year closed, there was every indication that the president, in his program of aid to Britain, China and Greece, could confidently count on the support of most Democrats in Congress. (O. McK.)

Deneen, Charles Samuel (1863–1940), former senator from Illinois, was born in Edwardsville, Ill., May 4, and was graduated from McKendree college in 1882. He was admitted to the bar in 1886 and practised in Chicago from 1890 to 1904 when he was elected governor of Illinois, serving two terms. He returned to the law at the expiration of his second term. He was appointed to the United States senate in 1925 to fill out the term of the late Medill McCormick and was elected to a full term, and at its expiration again resumed practice. He was active in reform movements in Chicago and while governor he brought about the passage of a presidential preference primary law. In 1912 he favoured the nomination of Theodore Roosevelt to the presidency by the Republican convention, but supported the regular nominee of the party. While in the senate he fought unsuccessfully to seat Frank L. Smith who had been elected but was charged with receiving campaign contributions from improper sources. He was also active in the movement which defeated the organization controlled by Governor Len Small, Mayor William Hale Thompson of Chicago and State's Attorney Robert E. Crowe. He died in Chicago, Feb. 5.

Denmark. A democratic monarchy in northern Europe; capital, Copenhagen; king, Christian X; prime minister, Th. Stauning. Area, 16,575 sq.mi.; population (official est., 1939) 3,805,000. Chief towns (1935): Copenhagen (843,168); Aarhus (90,898); Odense (78,403); Aalborg (48,132).

History.—As the year 1940 opened, Denmark was carefully steering a neutral course, hoping that her innocence and her economic value to both the chief belligerents might spare her from invasion. But in the early morning of April 9 the German bombers flew over Copenhagen and troops entered the city and crossed the frontier in Jutland. The government validated a decision really made long before and ordered submission; there was very little bloodshed. The Germans were anxious to gain co-operation from the Danes and treated the population perhaps as well as an occupying army can treat a conquered people. After an attempt to force acceptance of German money, for example, they yielded to the Danish opposition and began using Danish money; and Danish flags continued to fly. Increased trade with Germany was

FEW PHOTOGRAPHS of the German occupation of Denmark in April 19 were released by the Nazis during the year. This one shows two German offic conferring in the square of a Danish city

necessitated by the very circumstances of the war more than l military demands; Denmark sent vast quantities of pork, butte eggs, into hungry Germany, in return for promises of coal a machines—much of which could not be delivered on account transportation difficulties in the reich. No trade at all could l conducted with Denmark's chief customer, Great Britain.

The resentment of the Danes against Germany manifested itse in a deepened national feeling. For King Christian's 70th birt day (Sept. 26) they made a large national subscription (which l turned over to charity), and hundreds of thousands greeted hi in the streets of Copenhagen. On the first of September a natio wide community song-fest brought the people emotionally t gether. Occasionally outbreaks of violence (such as that Haderslev in South Jutland on Dec. 9) showed that the nazis we not having an easy time. Behind the emotional patriotism of th Danes lay a steady rise in unemployment and a skyrocketing prices to 150% and even 200% of prewar levels. And there la behind it, too, a sense of injustice suffered merely because th country was small and other countries were at war.

Finances and Banking.—Budget estimates, 1939–40: revenu 607,245,000 kroner; expenditures 622,547,000 kroner; 1940–4 revenue 607,035,000 kroner; expenditures 655,764,000 kroner. Th public debt (1939) was 1,229,141,000 kroner. The krone, n longer quoted on free exchanges, is normally worth about 25–2 cents.

Trade and Communication.—External trade (merchandise imports (1939) 1,740,347,000 kroner; exports 1,577,973,00 kroner. Price index (based on 100 for 1935): Jan. to Oct. 193 114; Jan. to Oct. 1940, 168.

Agriculture and Industry.—The table is given as a sample c what the war in 1940 was doing to Danish economy—meat pro duction up, for lack of fodder; milk production down, for lack c cows.

Production of Animal Products in Denmark
(Index figures based on 1935=100)

	Milk		Meat			Milk		Meat	
	1940	1939	1940	1939		1940	1939	1940	1939
Jan.	87	88	122	107	July	99	118	144	99
Feb.	88	92	120	143	Aug.	88	111	188	114
Mar.	97	98	138	118	Sept.	76	101	263	135
Apr.	103	108	145	118	Oct.	69	90	208	137
May	112	125	155	121	Nov.	..	85	..	136
June	119	127	114	92	Dec.	..	87	..	110

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Dentistry. The year 1940 marked the 100th anniversary of the founding of dentistry as a profession, through the establishment of the first dental school, the first dental magazine and the first dental association. This anniversary was celebrated in Baltimore, Md., under the joint sponsorship of the American Dental association, the Maryland Dental association and the University of Maryland. The first dental school to be established was the Baltimore College of Dental Surgery, now a department of the University of Maryland.

One of the outstanding developments in 1940 was the announcement by Harvard university of the starting of an entirely new plan of dental education. The object of the new plan is to train dentists who, besides receiving technical preparation in dentistry, would also have a sound biological and medical preparation, and consequently be better prepared to advance knowledge in dentistry and to meet the growing need for men equipped to play a useful role on the attack of dental problems in their relation to the public health.

X-Rays.—In the rapid development of the X-ray for diagnosis in dentistry, it was evident that some of its dangers were overlooked, through possibly familiar and wide use of this diagnostic procedure.

Plastics.—One of the outstanding developments in industry generally in 1940 was the rapid development of plastics for various uses. Dentistry has made use of the plastics in the denture field, plastics being used as a base material. Two papers, "A Century of Progress in Denture Base Materials," and "Non-Metallic Denture Materials—Their Development and Relative Merits" dealt intensively with this subject. Acrylic resins were being widely used, for they have many of the essentials of a satisfactory denture base material. Patents were closely held by certain concerns, which made the matter somewhat difficult for the dental profession.

Allergy.—Allergy in 1940 seemed to be attracting considerable attention in the field of medico-dental problems. This aspect of the dental problem was developed by a paper entitled, "The Role of Allergy in Medico-Dental Problems." Allergic reactions to substances used in dentistry were discussed, including denture base material, various types of local anaesthetics and various drugs used in the treatment of teeth. Focal infection and bacterial allergy, and malnutrition in allergic persons, were also well covered.

Operative Dentistry.—In the field of operative dentistry an attempt was made by one author to evaluate developments in operative dentistry, in which the author brought out the importance of studying the medical aspects of the dental problem before proceeding to do the reparative work ordinarily done by dentists.

Fluorine and Dental Caries.—In research in dental caries the role of fluorine in the prevention of tooth decay was one of the chief subjects of discussion during 1940. It has been known for a long time that fluorine in drinking water is the cause of mottled enamel, but investigations have suggested that a small quantity of fluorine in the drinking water serves as a protection against dental caries. In the state of Illinois this matter was particularly studied, and the incidence of dental caries in children was studied in four cities—Monmouth, Macomb, Quincy and Galesburg. "These cities are similar in their geographical and economic status, but differ in their water supplies." "Macomb and Quincy have 0·2 p.p.m. of fluorides in their water, whereas Galesburg and Monmouth have 1·7 p.p.m. fluorides. In the cities where the water had a low fluorine content, the incidence of caries is four and six, respectively, for a child. In the two cities whose water has high fluorine content, each child has on the average but two cavities." This rather startling report and the attention given some of this material by the press resulted in false impressions regarding the possibilities of fluorine as a preventive. The studies were of significance, but it was, of course, too early to make it possible to apply widely any therapeutic measures involving the use of fluorides to prevent caries.

Chemotherapy.—The widespread use of sulphanilamide in its various derivatives naturally interested the dental profession. Dentists began to use some of the derivatives of sulphanilamide in local lesions within the mouth. There was no evidence, however, that this method of use of this type of drug has any such profound effect as its internal administration.

Vitamins.—One of the interesting developments in the vitamin field of dentistry during 1940 was an increasing use of nicotinic acid for certain tongue difficulties which have suggested the possibility of subclinical pellagra. Just as vitamin C has proved to be of use in certain lesions in the gum which have been associated with a low vitamin C blood level and subclinical scurvy, so a deficiency of nicotinic acid seems also to have effect within the mouth, particularly on the tongue. Studies were going on of the effect of this useful method of treatment.

Books.—Probably the book most widely discussed, both by dentists and physicians, was that by Weston A. Price, entitled *Nutrition and Physical Degeneration.*

From the evidence presented, it is clear that in 1940 dentistry definitely shook off the shackles of mechanical therapy, and that this form of treatment would be the servant of dentistry rather than its master.

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(L. M. S. M.)

Dermatology. Stokes called attention to the psychosomatic factors and their relation to cutaneous disorders. The mechanism of emotional stress and the overproduction of acetylcholine with the resulting "intoxication" was linked with many diseases of the skin. It is against this "must-be-doing" personality that therapy is directed. The interaction of emotional and allergic factors and the infection-allergic complexes often makes a "cart and horse" interpretation difficult. The classification of psychosomatic diseases includes the erythema-urticaria group, the angioneuroses, vagus sympathetic imbalance (which embraces the eczema-asthma-hay fever group, prurigo and hyperhidrotic dermatoses) and, finally, a non-classifiable group (including psoriasis, lichen planus and warts).

The use of histaminase in atopic dermatitis, urticaria, hypersensitivity to chemical and physical agents and eczema produced indifferent results. Many of the hopeful reports which demonstrated the ability of this agent to "detoxify histamine" were not substantiated. There was some evidence, however, that histaminase is of value in light sensitivity.

The cheilosis associated with pellagra was shown to be due to the lack of vitamin B_2 (riboflavin) and responds to oral administration of that substance. In addition to well recognized deficiency diseases, Andrews pointed out the importance of nutritional deficiency in predisposing to other cutaneous diseases not directly related to avitaminosis. This may be true of many of the hyperkeratotic dermatoses. Forsyth used thiamin chloride successfully in the treatment of pink disease (acrodynia). The average daily requirement of vitamin B_1 for an adult is about 300 international units. In the treatment of acrodynia it was found that 600 units a day by mouth caused gradual improvement and finally complete recovery. More rapid response was obtained by the subcutaneous injection of 2,000 units a day.

It was not yet clear whether acrodynia is primarily a deficiency disease or whether it is due to a virus which develops in the peripheral nervous system rendered susceptible by lack of Vitamin B_1.

An unusual series of 26 cases of benign chronic pemphigus occurring in three families constituted what is probably a distinct familial form of pemphigus. Meleney reported the successful treatment of chronic undermining burrowing ulcers with the combined use of zinc peroxide and sulphanilamide. Belote reviewed the literature and presented a case pointing out that necrobiosis lipoidica diabeticorum may be present without diabetes. Ketron, in a review of the literature, found that 25% of all the cases of periarteritis nodosa exhibited some form of cutaneous manifestation. Cummer and La Rocco studied sickle cell anaemia, finding the sickle cell trait to be limited almost exclusively to Negroes, to be familial and apparently hereditary. Illustrative cases with chronic ulcers of the legs were reported. A careful review showed that sulphanilamide is of definite value in erysipelas, erythema multiforme, impetigo contagiosa, acute disseminate lupus erythematosus, chancroid and streptococcic lymphangitis.

O'Leary and Waisman studied 40 cases of dermatomyositis (primary polymyositis). This rare syndrome presents a difficult problem for both diagnosis and treatment. From a dermatologic point of view, the manifestations are variable and include erythema, oedema, pigmentation, sclerosis, atrophy, lupus erythematosus-like efflorescences, and lesions of poikiloderma atrophicans vasculare. There is usually a high febrile reaction and in nearly all the cases abnormal creatine metabolism is observed. Treatment by the use of vaccines, aminoacetic acid, sulphanilamide, physical therapy and artificial fever therapy have been suggested. In their series, half of the patients observed died.

An unusual series of 20 cases of leukoderma of occupational origin was reported by Oliver, Schwartz and Warren. The disease occurred in men employed at a tannery, who wore heavy rubber gloves. The cause was found to be an antioxidant added to the rubber to improve its ageing properties.

In spite of their great value, the drugs of the sulphonamide series invariably gave rise to cutaneous reactions of a greater or lesser degree. Long reported that 1·6% of adults and 3% of children showed a dermatitis following sulphanilamide; Blake reported that 10% of patients receiving sulphapyridine in the treatment of pneumonia, developed some form of cutaneous reaction to the drug. In a group of 78 patients receiving sulphathiazole, Haviland and Long reported 10 (12·8%) who developed various types of rashes, including those of urticarial, erythema-nodosum-like and morbilliform type. In addition, injection of the sclera and

conjunctiva was noted, this type of reaction not being observed in eruptions due to other members of the sulphonamide group. (*See* MEDICINE.)

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De Schweinitz, Paul (1863–1940), one of the six bishops of the Moravian church in the United States, was born in Salem, N. C., March 16. He was a descendant of Count Ludwig von Zinzendorf, who founded Bethlehem, Pa., and introduced the Moravian church into America. He was educated in the Moravian College and Theological seminary and ordained in 1886 after studying at the University of Halle. He served as a home missionary in Minnesota, as pastor of the Moravian church at Nazareth, Pa., and later held offices in the church organization. He was consecrated a bishop in 1937. He died in Bethlehem, Feb. 8.

Destroyers: *see* NAVIES OF THE WORLD; NEUTRALITY.

Detroit, in Wayne county, in southeastern Michigan, and on the Detroit river, the metropolis of the state, and the fourth city in the United States; area, 139·6 sq.mi.; population (U.S. census, 1940) 1,623,452. Foreign-born, about 400,000. Canadian and British predominate, greatly exceeding in numbers the Polish group, which is second in importance. Assessed value, $2,413,180,400; gross bonded debt as of Jan. 1, 1941, $359,159,688 which includes $98,951,739 of self-supporting utility debt; gross city appropriation, $137,353,529, including utilities; tax levy, $67,759,692; tax rate for city and school purposes, $28.08.

During 1940 union contracts were negotiated with all of the major automobile plants (except Ford) without serious difficulty, and labour difficulties were at a minimum as compared with previous years. The automobile workers' union had not in 1940 succeeded in securing an election in the Detroit plant of the Ford Motor company.

During 1940 the Detroit area made the most marked recovery of any county in the country, and the defence program brought industrial activity to a new high. New plants were being erected by both Packard and Chrysler, and Ford and other manufacturers received large army orders.

The influx of new workers created a shortage of low-priced housing with a resulting resurgence of building construction. It is expected that these conditions will be aggravated as the defence program gets under way.

By the close of 1940, industrial activity had not affected the relief situation as much as might have been expected. Approximately 15,000 families were on whole or partial relief as compared with 19,000 during the previous year and 24,000 on WPA as compared with 30,000. It was believed that this latter group would be rigidly reduced.

During the year, the administration of the city was affected by charges of corruption within the police department which resulted in the indictment of some 200 officials, policemen and civilians. The numerous cases had not been tried in 1940.

Increased tax collections plus effective restrictions on increase in city expenditures greatly improved the city's financial situation. Detroit was the largest American city to default on its debt during the depth of the depression and a considerab operating deficit accrued during the succeeding years. Duri 1940, however, a substantial portion of the debt was refund with corresponding reductions in interest charges and the cu rent deficit was reduced to $11,000,000 from a previous $15,00 000.

In the civic field the year was marked by charter amendmen placing the last remaining groups of city employees under ci service, the opening of a modern sewage disposal plant, compl tion of important street widenings by state authorities with the city and the announcement of plans for a large medical ce tre to be established by private funds as a part of the colle of medicine of the municipally operated Wayne university. Als city authorities concerned themselves with the rehabilitation the large blighted area surrounding the business section a contemplated experiments with limited dividend housing.

(L. D. U.)

De Tucić, Serge (1873–1940), Croatian playwright, w born in Pozega, Croatia, later Yugoslav After working as a sculptor for a short time he began to write f the theatre. His play *Truly Dom* (1896) was translated into se eral languages and was widely produced in southern Europ In 1904 King Ferdinand of Bulgaria made him the first direct of the National theatre in Sofia. During the World War 1914–18 he went to London, where in 1914 he published a bo on the Slav nations and later wrote a play, *The Liberators,* pr duced under the sponsorship of George Bernard Shaw and Wickham Steed. He was for two years professor of Slavon languages in Kings college, London. In 1918 he went to t United States. He died in New York city, Sept. 25.

Diabetes. Diabetes ranked ninth as a cause of death in t United States in 1938 (eighth, if premature birt be excluded) with a mortality per 100,000 of 23·8, the highe yet attained. In the state of New York the rate was 34·9 (193 and for the city of New York the estimated rate for 1939 w 38·8 per 100,000. Comparing the periods 1898–1914 with 193 40 in one large clinic, the average age at death rose from 44·5 64·8 years and the duration of the diabetes from 4·9 to 12·5 year In the same clinic the expectancy of life, as calculated by t statistical department of the Metropolitan Life Insurance co pany, has become quite uniform for all ages, two-thirds of that white persons in the United States. The number of diabetics li ing in the United States in 1940 probably reached 700,000 bas upon the National Health survey of 1935–36. The table shows t ratio of diabetics in the population according to age and sex.

Ratio of Diabetics in the General Population, U.S.A.

Age	Males	Females
0–14	1:2,500	1:2,500
15–24	1:1,700	1:1,700
25–34	1:1,100	1: 900
35–44	1: 500	1: 300
45–54	1: 225	1: 125
55–64	1: 100	1: 50
65 and over	1: 70	1: 45

The above data are based upon 9,182 diabetics in an (urban) population of 2,502,391 p sons. *National Health Survey.*

Diabetes is universal in distribution. The extraordinarily lo mortality reported in Arizona of 10, and the high mortality Rhode Island of 42 per 100,000 are explainable. Age and sex a justments account for a part of the diversity, but differenc in density of population, 3·8 versus 644 per sq.mi., as well a differences in race are important factors. In Arizona 10% the population are Indians, 26% Mexicans and only about 0·5 are Jews. A survey conducted by the writer in co-operation wit

the board of health and physicians in Arizona early in 1940 disclosed that (1) whereas Jews made up 0·5% of the population, they constituted 2·0% of the diabetics; (2) the disease was as common in the Indians as in the population as a whole; (3) fully as many or more diabetics were found in the prison and mental hospital as would be expected in the east and (4) diabetes was acknowledged by 1 in 42 doctors reporting in Arizona as compared with 1 in 35 doctors in Rhode Island. The opinion was expressed that throughout the world, "the incidence of diabetes is highest where (1) the average age is the oldest; (2) women predominate; (3) obesity is most frequent; (4) the proportion of Jews is greatest; (5) medical supervision is closest and (6) deaths are most accurately reported."

Arteriosclerotic causes of death have risen from 17·5% to 60·1% as diabetic coma has fallen during the same period from 63·8% to 3·6% among 5,669 deaths reported from one clinic between 1898 and 1940. But the significant fact disclosed is that deaths due to gangrene, *i.e.*, arteriosclerosis of the legs, have dropped in this interval despite three times the length of exposure to gangrene due to the increasing duration of the disease and the ageing of the average diabetic by 20 years.

The organization of diabetic summer camps is steadily increasing to meet the needs of the growing number of diabetic children. At least 18 were in existence in the United States in 1940. So, too, the number of diabetic societies was greater and a national society for the promotion of the study and care of diabetics was in process of formation.

In 1940 for the first time both the prevention and the cure of diabetes were effected, albeit as yet only in animals. The laboratories concerned in their epoch-making discoveries were those in Toronto and Philadelphia, but the work itself is the outgrowth of Young's production of diabetes by injection of anterior pituitary extract into cats and dogs.

Haist, Campbell and Best found that if insulin was simultaneously injected with anterior pituitary extract, above mentioned, the appearance of diabetes in the dog could be prevented. Other experiments with rats taught them that the insulin content of the rat's pancreas could be reduced by fasting or by use of a fat diet and lowered still more by the injection of insulin, whereas the amount of insulin rose with a carbohydrate diet. Interpreting these results on the theory that fasting, fat feeding and insulin all rested the pancreas, they demonstrated not only insulin but also fasting and fat feeding would prevent a dog becoming diabetic when injected with anterior pituitary extract.

Working with cats, Lukens and Dohan in Philadelphia found that even after the animals had had diabetes for several months following injections of anterior pituitary extract, treatment with insulin would lead to the disappearance of the lesions in the islands of Langerhans and produce an actual cure of the diabetes.

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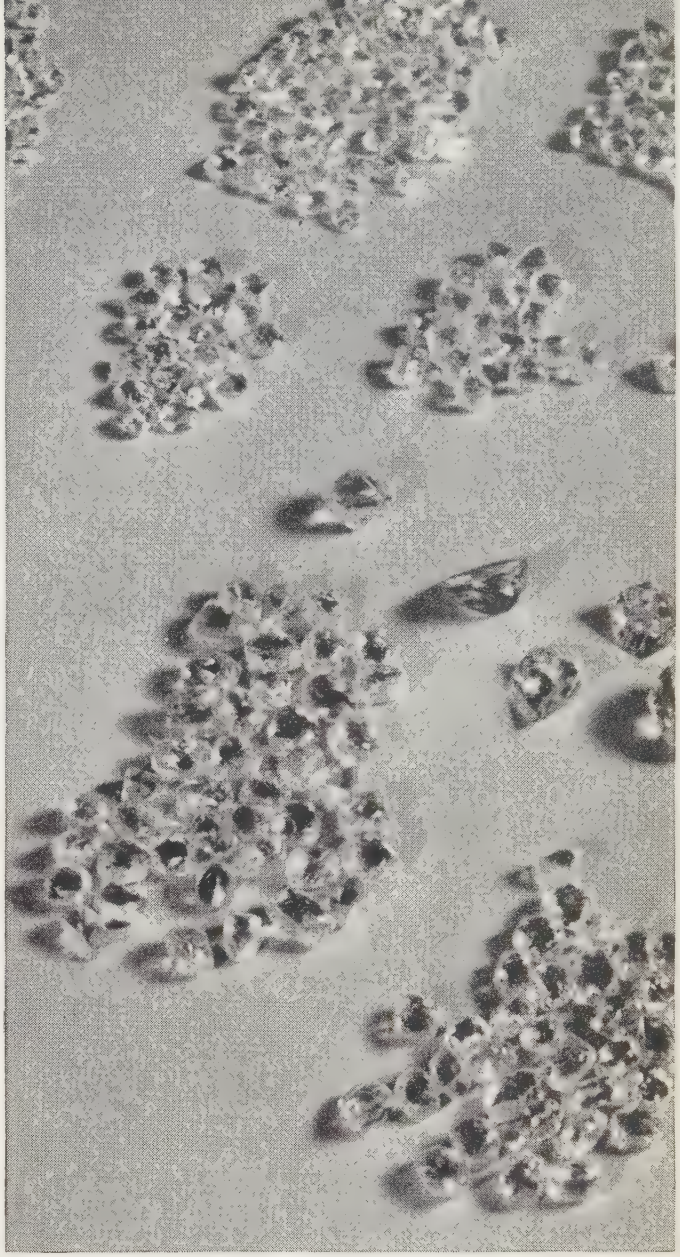
Diamonds. World output of diamonds in 1939 made another new record high of 12,400,000 carats, an increase of 8% over 1938, all of which came from the Belgian Congo, small increases in Angola and Brazil being more than offset by decreases in Gold Coast, South-West Africa and Sierra Leone. Although the Congo output amounted to 67% of the world total in bulk, it included such a high proportion of industrial stones that the percentage by value was probably nearer half this figure. The British empire produced only 24% of the total by weight, but nearly 60% by value. The Diamond corporation, the central selling agency of the industry, reported sales approaching £6,000,000 in 1939 as compared with £9,150,000 in 1937, a high of £12,000,000 and a depression minimum of £1,500,000 in 1932.

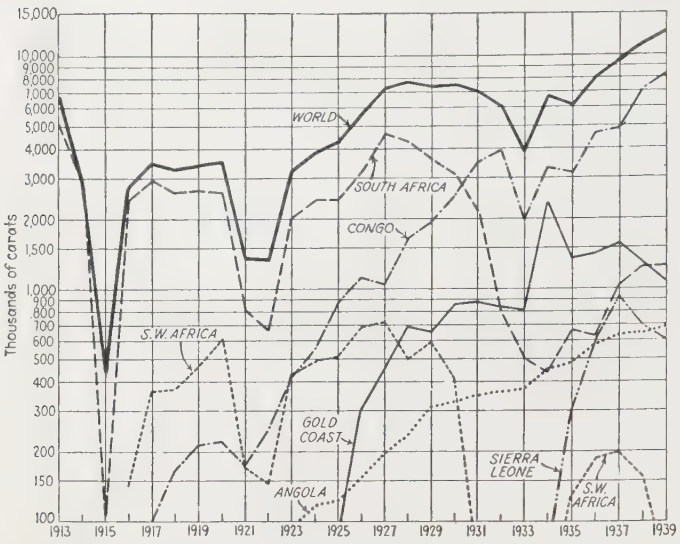


DISPLAY OF UNCUT DIAMONDS in New York city, 1940. As a result of the European war, the United States became the world centre of the diamond industry

In 1940 the only South African mine in active operation was the Wesselton, of the DeBeers company, in addition to which some recovery was made from blue ground stocks and from rewashing of tailings. Mine recoveries during the first half of 1940 were only 50% of the average rate in 1939, but alluvial recoveries rose 12% above the 1939 rate, giving a total recovery of 57% of 1939. Gold Coast during the first four months of 1940 was at about 43% of the 1939 average. No other operating data were received.

In 1939 the United States imported 4,211,000 carats of diamonds, valued at $45,099,000; this total included 154,000 carats of rough, 488,000 carats of cut and 3,569,000 carats of industrial stones. Imports of rough stones during the first ten months of 1940 exceeded the 1939 total by 29%, while cut stones were 52% less and industrial stones 14% less. The demand for diamonds for industrial use expanded at such a rate since 1938 that imports for 1939 and 1940 approximated the total for the two decades immediately preceding.

The occupation of the Netherlands and Belgium by Germany completely disorganized the cutting industry in those countries



DIAMOND PRODUCTION OF THE WORLD and the major producing countries (*The Mineral Industry*)

and shortly after, steps were taken toward the expansion of the small cutting industries that had been maintained in England and the United States. With the English position hampered by the continuation of the war, it seemed quite possible that both cutting and marketing activities might eventually be centred in New York city. (G. A. Ro.)

Dictatorships: *see* COMMUNISM; FASCISM; GERMANY; ITALY; RUMANIA; SPAIN; UNION OF SOVIET SOCIALIST REPUBLICS.

Diesel Engines: *see* ELECTRIC TRANSPORTATION.

Dies Investigating Committee: *see* CIVIL LIBERTIES; GERMAN-AMERICAN BUND.

Dietetics. A high light in nutrition was the discovery of a new vitamin. In 1940 pantothenic acid was identified with the obscure chick antidermatitis fraction of the filtrate factor of yeast. Not only was its structure determined, but it was also synthesized and appeared to function in human nutrition. It was reported 100 mg. of this acid may be administered to men without causing a reaction, change in blood pressure, pulse or respiration.

In well subjects the level of pantothenic acid in the blood is increased after its injection but returns to normal in 24 hours. In patients with pellagra, beri-beri and riboflavin deficiency this acid is 23% to 50% lower than normal in the blood. When the level of pantothenic acid is increased blood levels of riboflavin also appear to rise.

An illuminating study of the effects of a lack of thiamin was reported by workers at the Mayo clinic. Four healthy young women were placed for 21 weeks on a diet extremely low in vitamin B_1 but adequate in other respects. The symptoms which resulted resembled neurasthenia rather than the neuritis of chemical beri-beri. They were anorexia, fatigue, loss of weight, absence of or low gastric acidity, constipation, tenderness of muscles in the calves of the legs. There were also abnormalities in the electrocardiograms. The urinary output of thiamin dropped to 14 micrograms per day. By the time 12 mg. of thiamin had been administered over 12 days' time all symptoms had disappeared.

Evidence that pellagra is usually a complex deficiency of at least nicotinic acid, thiamin, riboflavin and B_6, now identified as pyridoxin, continued to pile up. Twenty more cases were reported in which symptoms of nutritional deficiency, not relieved with nicotinic acid, thiamin and riboflavin, were treated succe fully with pyridoxin.

The year 1940's most interesting vitamin C study was that o carefully controlled case of experimental human scurvy Crandon, Lund and Dill. Their experimental subject received six months a diet practically devoid of vitamin C. The ascor acid of the plasma was low within ten days and zero in d month. It took, however, 132 days for the first objective clini sign of scurvy to appear. This sign was hyperkeratotic papul followed by perifollicular haemorrhages after 161 days on the d ficient diet. Wound healing was normal at three months but bo weakness and weight loss were evident. Wound healing was n normal on the 182nd day, at which time the deficient diet w supplemented by ascorbic acid. The level of ascorbic acid in t blood plasma rose gradually to over 1 mg. per 100 cc. afte grams had been given in doses of 1 gram every third day. T and the 132 days required for clinical evidence of scurvy are used as basis for calculating the minimum requirement as 30 mg. per day.

The dark adaptation test continued to be used extensively in hum vitamin A studies. In experimental human vitamin A deficiency He found that 14 of his 17 subjects responded at once when vitamin A w again given, although permanent recovery took from six weeks to a ye Other investigators reported that one series of 200 pregnant women un good prenatal control usually had normal dark adaptation, while ove third of another group, 62% of whose diets contained less than 6,c I. U. of vitamin A, had poor readings. Cutaneous manifestations of vitam A deficiency in children were reported both from England and the Uni States. Nine diabetic children of 20 with poor dark adaptation also show the skin changes. These children did not respond in 14 days to la doses of carotene but after taking equal amounts, *i.e.*, 60,000 U.S.P. un of vitamin A in fish liver oil were normal in 3 to 21 days.

Two obvious lines of study of vitamin K were extended in 1940. Fi a number of derivatives of 1,4-naphthoquinone with biological value w studied. Of these 2 methyl-1,4-naphthoquinone called "synthetic vitam K" appeared to be more active than the natural forms. Second, m evidence was collected of the value of vitamin K in assuring normal hum blood coagulation as well as some limitation found as to its usefulne There appears to be no doubt of the value of vitamin K taken both bef and after operations, where there is prothrombin deficiency with abse of bile either because of obstruction or operative drainage. Genera accepted also was the value of vitamin K, preferably given to the mot at least four hours prepartum, in preventing or mitigating haemorrha disease of the newborn. Evidence of nutritional vitamin K deficiency adults was still fragmentary, but Kark and Scarborough found diminish plasma prothrombin which responded to vitamin K therapy in cases clinical hypovitaminosis. Vitamin K treatment is without value haemophilia.

Some success in the use of vitamin E in the treatment of muscular d trophies was reported.

The question whether vitamins D_2, that is calciferol, from irradia ergosterol and D_3, irradiated 7 dehydrocholesterol, the form of vitamin in cod-liver oil, are equivalent was answered in the affirmative for ost malacia and late rickets. The vitamin was given orally. This is similar the greater part of studies on infants. When given by injection, howev D_2 has been reported ineffective for human infants and monkeys.

One reason for the known advantage of milk as the major source calcium for children was suggested by recent experiments. Increas retentions of calcium were found when lactose was substituted for equal amount of sucrose in diets containing 0.5 gm. of calcium and oth wise favourable for its utilization.

Severe nutritional anaemia of over 50% of school children was report from certain areas in rural Florida, in the United States. "Salt sick" is common ailment of cattle in the same areas. The cattle are cured by givi them iron, cobalt and copper. The children, even those infected with hoo worm, were brought to normal haemoglobin levels by treatment w ferric ammonium citrate. This salt may be contaminated with cobalt a copper, but the investigators believe the children's deficiency is primar iron. (*See* also VITAMINS.)

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(M. C. H. B.)

Dill, Sir John Greer (1881–), British soldier, born Dec. 25 and educated at Cheltenham college and the royal military college, Sandhurst. He entered the army in 1901 and at the start of the World War of 1914–18 had been promoted to brigadier major. Thereafter he advanced through various grades to the rank of lieutenant general in 1936. His first military assignment was in South Africa (1901–02), where he received the Queen's medal with five clasps. During the war of 1914–18 he was decorated with the Distinguished Service order and the French and Belgian croix de guerre. After teaching in the imperial defence college (1926–28) and acting as commandant of the staff college at Camberley (1931–34), he was appointed director of military operations and intelligence at the war office in 1934. From 1936 to 1937 he commanded the British forces in Palestine, and in the latter year he became general officer commanding in chief of the Aldershot command. On May 26, 1940 he was appointed to succeed Gen. Sir Edmund Ironside as British chief of staff. Ironside at this time became commander in chief of the home forces.

Diphtheria: *see* EPIDEMICS AND PUBLIC HEALTH CONTROL; PUBLIC HEALTH SERVICES.

Diplomatic Services: *see* AMBASSADORS AND ENVOYS.

Disasters. During 1940 loss of life and property in accidents and disasters included the following:

Aviation

Feb. 27 Near Bucaramanga, Colombia. Eleven were killed when a passenger plane crashed into a mountain.
March 4 Wreckage of the Imperial Airway liner "Hannibal," which disappeared while on the way from Jiwani, Arabia, to Sharjah on the Persian gulf with 8 persons on board, was found on the shore of the gulf.
Mar. 17 Stromboli island, Italy. Fourteen were killed when the Italian air liner "I-Sutro" crashed against a volcano.
May 27 Riverside, Calif. Army bombing plane crashed to the ground, killing 6 of the 7 men on board and critically injuring the other.
June 17 Bellerose, N.Y. Eleven army officers and men were killed when 2 bombing planes collided.
Aug. 13 Canberra, Australia. A royal Australian air force plane, flying from Melbourne to Canberra, crashed near the latter city, killing 9 persons, including 3 cabinet members.
Aug. 23 Near Mt. Gaina, Transylvania. A passenger plane on the way from Bucharest to Vienna crashed, killing the 12 passengers and the crew of 3.
Aug. 31 Near Lovettsville, Va. A plane of the Pennsylvania airlines crashed, killing 21 passengers, including Sen. Ernest Lundeen of Minnesota, and the crew of 4; crash was first fatal accident on U.S. commercial airways since March 26, 1939.
Nov. 4 Near Salt Lake City, Utah. Ten persons were killed when a plane crashed into the side of Bountiful peak in the Wasatch mountains.
Nov. 8 Rio de Janeiro. Nineteen persons were killed when a passenger plane collided with another plane and fell into Botafogo bay.
Dec. 4 Chicago, Ill. A passenger plane crashed after striking a high tension wire at the edge of the airport. Six persons were killed outright; four died later.

Fires and Explosions

Jan. 3 Minneapolis, Minn. Nineteen killed in a fire which wrecked the Marlborough apartment hotel.
Jan. 10 Bartley, W.Va. Ninety-one workmen trapped underground killed in an explosion in a coal mine.
Feb. 29 Arsa, Italy. Eighty-six were killed and 100 injured by an explosion in a coal mine.
Mar. 16 St. Clairsville, O. Seventy-five persons were killed by an explosion in the Willow Grove coal mine.
April 14 Colon, Panama. Five persons were killed and 10,000 rendered homeless by a fire which destroyed a third of the city, causing a loss estimated at $4,000,000.
April 23 Natchez, Miss. One hundred and ninety-eight persons were burned to death in a fire which destroyed a Negro dance hall.
May 7 Sandona, Colombia. One hundred and three persons, 67 of whom were children, were killed and 125 injured in a fire which destroyed the municipal palace.
May 27 Colombia. Twenty members of the crew of the oil tanker "Guayabito" were killed on the Magdalena river when 6,000 bbl. of gasoline on board exploded.
July 15 Sonman, Pa. Sixty-three persons were killed by an explosion in the Koppers Company coal mine.
Aug. 16 Joplin, Mo. Five persons were killed by an explosion in the dynamite plant of the Atlas Powder company.
Aug. 20 Gibbstown, N.J. Five persons were killed by an explosion in the dynamite plant of E. I. du Pont de Nemours & Co.
Aug. 29 Bologna, Italy. Thirty-eight workmen were killed and 174 injured by an explosion in a munitions plant.
Sept. 12 Kenvil, N.J. Forty-nine persons were killed, about 200 injured and a large number of houses in the surrounding country were wrecked by an explosion in the plant of the Hercules Powder company.
Sept. 22 Sogamoso, Colombia. Twenty children were killed and 4 seriously injured in a panic caused by an alarm of fire in a motion picture theatre.
Nov. 12 Woodbridge, N.J. Nine persons were killed by an explosion which destroyed the plant of the United Railway Signal corporation.
Nov. 12 Edinburg, Pa. Three men were killed when 1,000 lb. of dynamite exploded in the plant of the American Cyanamid and Chemical corporation.
Nov. 12 Allentown, Pa. Three men were killed by an explosion in the plant of the Trojan Powder company.
Nov. 25 Haifa, Palestine. An explosion wrecked the steamer "Patria" on which 1,771 Jewish refugees were awaiting transfer to a British colony, killing 22, and seriously injuring 25.
Nov. 28 Toppenish, Wash. Seven persons were killed by an explosion in a dynamite storage warehouse.
Nov. 29 Cadiz, Ohio. An explosion in a coal mine trapped 30 miners who died before they could be rescued.
Dec. 14 Rumania. Fifty-one men were killed and 250 more trapped by an explosion in a coal mine 150 mi. northeast of Bucharest.
Dec. 17 Cincinnati, Ohio. Thirteen persons were killed by an explosion in an apartment house.

Marine

Jan. 21 Near Toulon, France. Explosion in engine room of the Italian passenger ship "Orazio" in the Mediterranean set fire to the vessel, resulting in the death of 50 passengers and 60 of the crew.
Feb. 18 La Corunna, Spain. Twenty-two seamen were drowned when the Spanish steamer "Banderas" sank off shore.
Feb. 25 Vigo, Spain. Thirty persons were drowned by the sinking of a small boat in Marin inlet.
Mar. 4 Ningpo, China. Two hundred and fifty persons were drowned when the ship "King Shing" capsized in the Yung river.
Aug. 2 Near Straits of Magellan. Chilean passenger steamer "Moraleda" struck a rock and was wrecked with the loss of 76.
Oct. 13 Black sea. A small sailing vessel capsized near Gorele; 33 were drowned.
Oct. 25 Sweden. At least 44 persons were drowned when a barge, carrying 80 soldiers engaged in manoeuvres, capsized on Lake Armasjaervi.
Nov. 10 St. John's, Newfoundland. Twenty-eight persons were drowned when a ferry boat struck a small motor boat in Conception bay and sank.
Nov. 20 Melbourne, Australia. Twenty-four naval reservists were drowned when a merchant ship collided with and sank the minesweeper in which they were sailing across Port Phillip bay.
Dec. 13 Istanbul, Turkey. More than 200 Jewish refugees from Bulgaria were drowned in the Sea of Marmora when their ship was wrecked.

Motor Traffic

Jan. 17 Zittau, Germany. Twelve passengers killed and 20 injured when railroad train hit a bus at grade crossing.
Jan. 29 Mexico. Thirty-two passengers killed and 23 injured when the gasoline tank exploded on a bus running from San Bartolo to Otolotepec.
Mar. 14 McAllen, Tex. Twenty-seven were killed and 15 injured when a passenger train collided with a truck loaded with fruit pickers.

Motor Vehicle Accidents in U.S.A.—1940

Number of deaths	34,400
Number of deaths (1939)	32,386
Number of non-fatal injuries	1,200,000
Deaths per 100,000,000 vehicle miles	12.0

Natural Disasters

Jan. 2 Kemal Pasha, Turkey. Five thousand drowned and 1,000 rendered homeless by a flood which swept over the region.
Jan. 18 Balcittoy, Turkey. Fifty persons killed, 160 injured and 200 houses wrecked by earthquake.
Feb. 10 Albany, Ga. A tornado swept over the city, killing 17 and destroying property valued at $10,000,000.
Feb. 21 Turkey. One hundred and twenty-five were killed and hundreds injured by an earthquake which wrecked Soysalli and 3 other villages in Kayseri province.
Mar. 12 Shreveport, La. Thirteen were killed and 37 injured and hundreds made homeless by a tornado which swept over the city.
Mar. 29 U.S.A. A tornado sweeping over parts of Texas, Louisiana, Alabama and Mississippi wrecked more than 100 houses and in Pierre Part, La., killed 6 and injured 50 persons.
April 1, 2 New York and Pennsylvania. Floods caused the death of 17 persons, made thousands homeless and washed away many bridges.
April 30 U.S.A. Tornadoes sweeping over the midwest and south killed 9 persons and wrecked hundreds of buildings.
May 18 Imperial valley, Calif. Earthquake killed 8 and injured scores of others in the towns of El Centro, Imperial, Heber, Brawley and Mexicali.
May 24 Peru. Earthquake which struck Callao, Lima, Chorrillos and other cities killed approximately 350, injured 1,500 and caused widespread damage.

Above, left: THE WORST FIRE in the history of Minneapolis killed 19 persons i apartment hotel Jan. 3, 1940

Above, right: U.S. CIVIL AVIATION'S LONG RECORD of 17 months without a accident came to an end Aug. 31, 1940, when a transport plane crashed Lovettsville, Va., and killed 25, including Senator Ernest Lundeen of Minnesota was the worst disaster in the history of U.S. air transport

Left: PERU'S WORST EARTHQUAKE in a half century took a toll of 350 May 24, 1940. The picture shows a ruined cemetery in Lima

Below: WRECKAGE of New York Central train which jumped the track Little Falls, N.Y., April 19, 1940, killing 31 and injuring 100

June 30 Southern Tex. Following heavy rainstorms, the Lavaca, Colorado and Guadalupe rivers flooded many towns including Hallettsville and Cuero, drowning at least 10 persons and causing property damage estimated at $5,000,000.
July 12 Seoul, Chosen. Fifty-two persons were killed, 100 injured and thousands made homeless by typhoon.
July 13 Miyake-shima island, Japan. At least 20 persons were killed by the eruption of the volcanic Mt. Yuzan; others reported missing.
July 25 Chile. Storms in the northern provinces caused approximately 100 deaths.
July 30 Anatolia, Turkey. More than 1,000 persons were killed by an earthquake.
Aug. 7 Tex. and La. A hurricane swept inland over the Sabine river region, flooding towns and drowning 19 persons.
Aug. 11 Eastern U.S.A. A hurricane swept over the coast from Savannah, Ga., to Georgetown, S.C., flooding coast islands and cities and killing at least 16 persons.
Sept. 30 Formosa. A typhoon which struck the southern coast killed 50 persons, destroyed 5,000 homes and seriously damaged crops.
Oct. 18 Barcelona and Gerona, Spain. One hundred and eighty-two persons were drowned by floods in these provinces.
Oct. 20 France. Floods in the southwest caused the death of 100 persons.
Oct. 26 Nicaragua. Fifteen persons were killed by a hurricane which swept over the Prinzapolca district.
Nov. 10 Rumania. Four hundred persons were killed and 800 injured by an earthquake which centred in Focsani.
Nov. 11 U.S.A. A blizzard descending from Canada, accompanied by tornado-like winds and low temperatures, swept over the middle west and Rocky mountain states and as far south as Louisiana, killing more than 100.
Nov. 18 Jamaica. One hundred and thirty persons were drowned in a cloudburst in two provinces.
Dec. 7 Philippines. Eighty-one persons were killed in a typhoon which swept southeast of Manila.
Dec. 26 Bejucal, Cuba. Forty persons were killed and 150 injured by a tornado accompanied by heavy rains.

Railroads

Jan. 29 Osaka, Japan. Two hundred burned to death and 100 injured in a train wreck.
April 19 Little Falls, N.Y. While rounding a curve at high speed, the "Lake Shore Limited" of the New York Central railroad ran off the track, killing 31 persons and injuring 60 seriously.
May 27 Bahia Blanca, Argentina. Twenty passengers were killed and 27 injured when an automobile struck a railroad train at a crossing.
July 31 Cuyahoga Falls, O. Forty-three persons were killed when a suburban passenger car collided head-on with a freight train on the Pennsylvania railroad.
Aug. 5 Near Calcutta, India. Thirty persons were killed and 70 injured when the Dacca-Calcutta mail train was wrecked.
Nov. 4 Taunton, England. Twenty-seven persons were killed and 59 injured when a London-Penzance express train was derailed.
Nov. 29 Soochow, China. Seventy-four persons were killed and 102 injured when a Japanese-operated Shanghai-Nanking train was derailed by a blast of dynamite.
Dec. 3 Velilla de Ebro, Spain. Forty-one persons were killed and 80 injured when two express trains collided.
Dec. 15 Iguala Caztal, Mexico. Twenty-five persons were killed and 46 injured when a railroad train ran off the tracks near the city.

Disciples of Christ, a religious body having its chief strength in the United States and Canada, which received its initial impulse in 1809, dates its separate existence from 1830, and its nationally organized work from 1849. It is also well represented in Great Britain, Australia and many mission fields. Local churches are generally known as Christian Churches or as Churches of Christ. The familiar designation, "Campbellite," derived from the name of the earliest leaders, Thomas and Alexander Campbell, is resented. The headquarters of the United Christian Missionary society and other promotional and educational agencies are at Indianapolis, Ind. The National Benevolent association has headquarters at St. Louis, Mo. The annual international convention (United States and Canada), usually held in October, was omitted in 1940 but will meet in May 1941 at St. Louis (H. B. McCormick, president). A North American convention, a mass assembly not related to the organized missionary agencies, was held in Indianapolis in October. Disciples of Christ co-operate in all interdenominational activities, are members of the federal council and are participating in the formation of the World Council of Churches. World membership in 1940 was 1,829,465 (gain for the year, 11,302); churches 8,924 (gain 22). In the United States and Canada there were 1,669,222 members (gain 11,796); 8,070 churches (loss 1); 7,501 ministers (gain 35). Receipts of national and state agencies reporting to international convention were $4,044,650. Receipts for local church maintenance, $11,065,286. There are many independent missionary agencies not reporting. (W. E. Ga.)

District of Columbia: *see* Washington, D.C.
Divorce: *see* Marriage and Divorce.
Dobruja: *see* Bulgaria; Minorities; Rumania.

Dodd, William Edward (1869–1940), former U.S. ambassador to Germany, was born in Clayton, N.C., Oct. 21. He was graduated from the Virginia Polytechnic institute in 1895, taught history there for two years and was on the faculty of Randolph Macon college until 1908 when he became professor of American history in the University of Chicago. He wrote many books dealing with the history of the United States and developed a school of teaching known by his name. He was appointed ambassador to Germany in 1933, serving until 1937 when he resigned.

He defended the rights of American citizens in Germany and incurred the hostility of the Hitler regime. When he returned home he made many addresses criticizing the methods of the German government and when the German ambassador protested to the state department the ambassador was told that free speech was still allowed in the United States. He died in Round Hill, Va., Feb. 9.

Doerpfeld, Wilhelm (1853–1940), German archaeologist, was born Dec. 26 in Barmen, Germany, and was educated at the Bauakademie in Berlin. He early became interested in Greek antiquities and from 1877 to 1881 took part in the excavations at Olympia.

In 1887 he was made secretary of the German Archaeological institute in Athens. He conducted the excavation of many ancient theatres and in 1906 published a book on their design, *Das Griechische Theater.* He was associated with Heinrich Schliemann in the excavation of ancient Troy. Kaiser Wilhelm II bought a lot and built a house for Dr. Doerpfeld on the Greek island of Levkas, where he died April 26.

Dog Shows: *see* Shows: *Dogs.*

Dolmetsch, Arnold (1858–1940), French musician, was born at Le Mans, Feb. 24, and died in Surrey, England, Feb. 29. For a biographical sketch see *Encyclopædia Britannica,* vol. 7, p. 510.

Dominica: *see* West Indies, British.

Dominican Republic, a West Indian republic occupying the eastern two-thirds of the island of Hispaniola; language, Spanish; capital, Ciudad Trujillo; president, Dr. Manuel de Jesús Troncoso de la Concha. The area is 19,326 sq.mi. The population by the 1935 census was 1,479,417. Aside from 73,070 aliens, there were 13% white, 71% "mixed," 16% Negroes. Official estimates of population in 1940 were 1,656,219. The chief cities (with 1935 pop.) are: Ciudad Trujillo, 71,091; Santiago de los Caballeros, 34,175; San Pedro de Macorís, 18,617. Nearly five-sixths (82.2%) of the population is rural.

History.—On March 7 President Jacinto B. Peynado died, to be succeeded by Vice-President Manuel de Jesús Troncoso de la Concha. The change had little significance, however, for Generalissimo Rafael L. Trujillo y Molina, former president and dictator (1930–38), retained political control of the island republic. Plans for the resettlement of European refugees in the Dominican Republic continued. In May the vanguard reached the coun-

try and began development of the 26,000-ac. estate given by Generalissimo Trujillo. It is planned that, eventually, some 100,000 refugees will participate in the experiment, the most extensive of its kind. By the end of 1940 some 500 new settlers were at Sosua; almost as many others were en route. In August, charges were made that the Dominican-German Scientific institute, founded in 1937, was engaged in "fifth column" activity. A loan of $5,000,000, to be used largely for public works at San Pedro de Macorís, including a highway to Samaná bay (40 miles away), a potential United States naval base, was granted to the Dominican government by the United States Export and Import bank.

Education.—In 1937, there were 845 primary, 7 secondary and 46 vocational schools, with an enrolment of 123,113.

Finance.—The monetary unit is the peso, equivalent to the United States dollar. Since 1905, by treaty arrangement, fiscal control has been in the hands of a financial adviser and receiver-general of customs appointed by the president of the United States. Under a treaty between the two countries, signed Sept. 24, 1940, the control was abolished. The treaty was approved by the Dominican government, but had not received the necessary ratification of the United States senate at the end of the year.

Trade and Communication.—External communication is by sea and air. There are 268km. of railway, and a highway network of some 1,500km. extent. An additional 982km. of railroad is in use on sugar and other estates.

In 1939 imports (79% manufactured goods) totalled $11,592,166, a 2·2% increase over 1938, coming principally from the United States (59%), Japan (10%), Germany (8%), Great Britain (5%) and British India (4%). Exports aggregating $18,643,302 (23% more than in 1938) went chiefly to Great Britain (36·2%), United States (27·1%), France (11·9%) and French Morocco (8·7%). In the first third of 1940, imports declined 6·9%; exports, however, increased by 19%, going principally to Great Britain (43·1%), the United States (14·6%), Ireland (13·5%), France (11·6%) and French Morocco (6%). The chief exports are sugar (63·3% in 1939), cacao, in which the Dominican Republic ranks fourth in world production (10·8% in 1939), and coffee (9%). Primarily agricultural, the country depends especially upon these three export commodities. (L. W. Be.)

Donations and Bequests.

American philanthropy was estimated by Robert R. Doane as representing a $20,000,000,000 investment, three-fourths of this in property and the remainder in funds, which brings an annual income of some $150,000,000. The amount of money which Americans give away each year is a matter for conjecture, and varying estimates have been made as high as $2,500,000,000. Income tax returns, in preliminary figures for 1938, the last available, show contributions amounting to $401,939,000. The comparable figures for 1937 were $440,010,000. This sum represents only deductible contributions to the extent of 15% of income. It does not include foundation giving, and naturally must be accepted as representing only a portion of American donations for the year.

While there were no complete figures on American donations and bequests, there were several indices, and on the basis of these indices it seemed reasonable to estimate that giving in America in 1940 showed a slight upward trend.

One index readily available was the results of 1940 community chest campaigns. A report of 252 chests which completed their campaigns during 1940, for work in 1941, as published by Community Chests and Councils, showed these chests raised a total of $40,966,012 as compared with $39,922,415 in 1939, an increase of 2·6%. These chests reached an average of 98·1% of their goals. Only once before since 1920 (in 1931) have chests averaged 98% of their objectives. The index provided by community chest returns represented widespread giving in both large and small communities, and it probably indicated a better average trend than any other index available. The results reported by chests during 1940 would seem to answer fears that giving to foreign relief has detracted from giving for philanthropic and charitable causes in the United States.

War relief was the object of generous giving in the United States during 1940, but it will not be possible to determine exactly to what extent until final reports for the year have been rendered by war relief agencies to the state department. However, some indication of war relief giving was found in the index of giving next discussed.

For ten years it has been the practice of the John Price Jones corporation to make a continuing study of all gifts and bequests which are publicly announced in seven of the larger cities of the United States. The cities included in the study are New York, Chicago, Philadelphia, Boston, Washington, Baltimore and St. Louis. Admittedly this study gives an index which covers large giving—since only large gifts are usually publicly announced—and it covers giving in centres of wealth. However, this index has long been regarded as a fair indication of the status of giving in metropolitan centres, at least.

During 1940 this study showed the publicly announced gifts in the seven cities studied totalled $61,997,707, with a comparable figure of $58,058,03 in 1939. Thus there appears to be an increase of nearly $4,000,000 in publicly announced gifts in the cities studied.

In these seven cities giving to foreign relief, as was reported publicly, totalled $14,933,591 as compared with $4,572,435 in the same cities in 1939. If this index holds for the entire country, it would seem that there has been a great increase during 1940 in giving for foreign relief, but probably at no great sacrifice to continuing local philanthropies. Bequests which became effective in these seven cities during 1940 reached $15,723,127 as compared with $22,661,863 in 1939.

Another index of giving is to be found in the number of philanthropic foundations established during the year. There were an estimated 30 foundations on Jan. 1, 1940. Since that time there have been at least 2 new foundations created for various charitable objectives, with resources of varying amounts. This increase in the number of foundations may offset an apparent decrease in the amounts given by some of the larger foundations. A study of nine of the largest foundations shows that their total distributions in 1925 were $29,395,362, whereas these same foundations distributed but $25,991,133 in 1939, the last available figures.

On the basis of the indices discussed here, it seems reasonable to assume that American generosity increased during 1940, and might be expected to increase during 1941. (*See* Carnegie Trusts; Commonwealth Fund, The; Falk Foundation, The Maurice and Laura; Rockefeller Foundation; Rosenwald Fund, The Julius; Russell Sage Foundation.) (J. P. J.)

Draft: *see* Selective Service.
Drama: *see* Theatre; Radio, Industrial Aspects of.
Dress: *see* Fashion and Dress.

Drought.

Records of many kinds show that drought conditions of sufficient severity to cause major crop failures and thereby affect a whole nation's economy have occurred at one time or another over nearly every part of the world. The decade from 1930 to 1940 having passed into history, there now can be recorded what appears to be the end of one of the most phenomenal long-period droughts of modern times, a drought that shook the economic foundations of the greatest agricultural country in the world.

During that decade the important central and western agricultural regions of the United States suffered at least seven lean years of rainfall deficiency. In some localities, particularly the so-called "dust-bowl" area of the adjoining parts of Kansas, Oklahoma, Texas, New Mexico and Colorado, only the abundant spring and early summer rains of 1940 brought the parched plains back to their normal verdure. The unprecedented autumn drought of 1939 over the entire middle west was the climax. There still were a few isolated spots, such as in some parts of Nebraska, where the summer and fall of 1940 passed without adequate relief, but for most of the areas the sustained drought had ended in 1940.

The year 1940 brought its own drought problems in some sections. Midsummer dryness was detrimental to crops in the Ohio valley, Missouri, Nebraska, South Dakota and parts of Iowa. The month of July 1940 was drier than or as dry as any July during the arid '30s in these areas, but June and August had ample rains except in parts of Nebraska.

The central Rocky mountain states were lacking in summer moisture until copious rains fell in September. In Utah, particularly in the Great Salt Lake basin, an unusually hot and dry summer resulted in severe losses of unirrigated crops.

Over an area of the southeastern states, centring around Georgia, pastures failed and no sowing was attempted owing to drought conditions during September and October.

Reports of drought conditions in various parts of the world included the long dry period in Australia starting early in 1940 and continuing through September. This was largely responsible for one of the most severe reductions of the wheat crop in Australian agricultural history. The wheat is seeded in May and harvested late in the year. In Ireland the dairy industry and other agricultural pursuits were seriously affected by a long drought which lasted all summer. A dry spring and early summer in China and Japan were detrimental to crops, particularly cotton and rice.

On the whole, the year 1940 was one in which crop curtailment through interference of the war in agricultural efforts was more serious than unfavourable weather. (*See* also AGRICULTURE; DRY FARMING; DUST STORMS; IRRIGATION.) (H. R. B.)

Drugs and Drug Traffic. The drug industry was active during the fiscal year 1940 in reviewing label claims and voluntarily correcting some practices that would be in violation of the new Federal Food, Drug and Cosmetic act when it became effective in all of its provisions on July 1, 1940. The medical staff of the Food and Drug administration developed facts and information upon which to base scientifically sound policies relating to dangerous drugs, adequate directions for use, adequate warning statements and justifiable therapeutic representations. In response to requests, the conclusions and findings derived from those studies were made generally available. Widespread changes in the composition and labelling of many classes of drugs were effected. An example of this educational effort may be seen in the field of so-called headache remedies. The composition of a large number of such preparations was radically changed, and in many instances the dosages of potentially dangerous ingredients were sharply reduced.

Of 2,987 consignments of imported drugs, medicines and devices which were examined at ports of entry during the fiscal year of 1940, 1,192 were refused entry into the United States. In the enforcement of the interstate features of the act, 474 court actions were instituted on drugs and devices. Altogether 10,009 shipments of domestic and imported drugs and therapeutic devices were sampled and examined.

Primary attention was given to the drug products that might be dangerous to health when used in the dosage or with the frequency or duration prescribed, recommended or suggested in their labelling. This was a follow-up of intensive work of 1939. Attention was given to the output of 312 manufacturers, with 194 factory inspections and the examination of 564 domestic samples. Twenty-five consignments were seized.

The examination of preparations purporting to comply with U.S.P. standards resulted in 21 court actions. Of 3,151 cans of U.S.P. anaesthetic ether examined, 10 cans, or less than 0·32%, failed to meet the pharmacopoeial standard. Continued improvement in the quality of anaesthetic ether is evident. Three court actions were instituted because of failure of preparations purporting to be of National Formulary quality to meet the requirements. Eight court actions were instituted against traffic in unofficial preparations.

Legal actions against non-sterile surgical dressings included seizure of 56 consignments of absorbent cotton, cotton swabs and dressings. Continued action against defective prophylactics resulted in 133 seizures. Only three seizures of dangerous devices were necessary during 1940. The term device in the act of 1938 includes instruments, apparatus and contrivances, including their components, parts and accessories, for use in the diagnosis, cure, mitigation, treatment or prevention of disease. These devices are for the first time subject to federal control.

There were on the market in 1940 a great variety of proprietary foods that were sold for use in the diet of infants and of adults suffering from some ailment. Many of them unwarrantedly were sold under extravagant claims and fancy names at exorbitant prices. The Federal Food, Drug and Cosmetic act provides that a food shall be declared to be misbranded if it purports to be or if represented for special dietary uses, unless its label bears such information concerning its vitamin, mineral and other dietary properties as may be necessary in order fully to inform purchasers as to its value for such uses. The products of 199 manufacturers of special dietetic products were given attention during the year. Several court actions were instituted.

The act prohibits traffic in new drugs unless such drugs have been adequately tested to show that they are safe for use under the conditions prescribed for use in their label. This makes it necessary for the Food and Drug administration to determine whether each new drug to be placed on the market is safe within the meaning of this provision. Up to the close of the fiscal year 1940 new drug applications to the number of 2,752 were received. (W. G. CA.)

League of Nations.—During the war year Sept. 1939–Aug. 1940 the Opium Advisory committee (O.A.C.), the Permanent Central Opium board (P.C.O.B.) and the Drug Supervisory body (D.S.B.) continued to ensure the working of the international control entrusted to them by the various opium and drug conventions.

The P.C.O.B. and the D.S.B. held their sessions in the spring of 1940 to review the statistics, examine drug estimates, and communicate to governments the statements of estimated drug requirements which constitute the basis of the international drug control. The O.A.C. held its 25th session in Geneva, from May 13 to 17, 1940. It devoted its attention more particularly to the possible repercussions of the war on national and international supervision of drugs. The O.A.C. viewed with concern the possible repercussions of the international situation on the object of its work. It drew the attention of the governments to the fact that recent wars, and particularly the war of 1914–18, resulted in a serious increase of drug addiction and a dangerous extension of the illicit traffic due to the absence of national or international legislation of a repressive character, and to the lack of any adequate system of control. The O.A.C., therefore, strongly recommended that governments and international organs functioning under the international opium conventions should take all necessary measures to prevent an increase of drug addiction.

Governments were also warned not to lose sight of two factors which are a constant menace to the progress so far achieved: (1) the clandestine manufacture of drugs and (2) the progressive accumulation of raw opium stocks due to the constant overproduction, as compared with recognized world requirements, of this raw material. These stocks and this over-production offer opportunities for the clandestine manufacture of drugs and directly for the illicit traffic in raw opium.

It should be noted in this connection that the raw opium seized in the far east continued to be of Iranian and Chinese origin. Smuggling continued southward from North China and Jehol. The situation in the far east was in a progressive state of deterioration notwithstanding the laudable efforts of the National government of China.

The work of the O.A.C. concerning the limitation of the production of raw opium reached the advanced stage of a preliminary draft convention, which was referred to governments for consideration. The O.A.C. decided that while it is obviously impossible for the time being to summon the proposed conference to consider the limitation of the production of raw opium, the studies aiming at the completion of the text of the preliminary draft convention should be continued.

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(H. J. A.)

Drug Therapy: *see* PSYCHIATRY.
Drunkenness: *see* INTOXICATION, ALCOHOLIC.

Dry Farming. Front page news was conspicuously absent from the United States dry farming area in 1940 as farmers and various governmental agencies continued the long evolutionary process of developing types of farming and livestock husbandry calculated to prevent repetition of the disastrous dust storms of a few years ago. No tragic dust storms developed, although thousands of acres were still unreclaimed, bare or sparsely covered with vegetation and were potential sources of dust storms. In its reports of operations in dry farming areas the soil conservation service of the department of agriculture refers to the successful use of crested wheatgrass in reclaiming grazing areas in the northern great plains. The SCS has planted 150,000ac. to crested wheatgrass, a plant imported from Russia and Siberia 42 years ago. Advantages of the plant are described as its resistance to drought, insects, weeds and winter killing and that it has 80 to 100% greater grazing capacity than native grasses. In the Pacific southwest kikuyu grass, imported from Uganda, Africa, in 1915, has been found of practical value in preventing gully washing. Probably more fundamental than the selecting and adapting of plants to dry farming areas is the work of the soil conservation service in determining the practical relation between soil maintenance and profitable farming under varying conditions in the dry farming area. A revealing discussion of this problem appears in "The Size of Farms in Soil Conservation" by George W. Collier in *Soil Conservation,* Sept. 1940, published by the SCS. In addition to the SCS and the CCC, the federal land banks and the land bank commissioner were also active in soil conservation efforts, since it is estimated that $50,000,000 of farm loan security is blown or washed away annually from farms not adequately managed to prevent erosion losses. (S. O. R.)

Ductless Glands: *see* ENDOCRINOLOGY.
Dust Bowl: *see* DROUGHT.

Dust Storms. In spite of the prolonged drought that occurred in the summer and fall of 1939, dust storms in 1940 were much less severe in the Texas and Oklahoma panhandles than during any previous year since 1932; winter snows and spring rains tended to make emergency tillage more effective in controlling soil blowing. In west central Kansas and parts of eastern Colorado, dust storms were relatively severe during the spring months of 1940. There was an increase over 1939 in the blow acreage in this area and in some localities dust storms were more frequent than in 1939. In the northern plains states there was no soil blowing which could be classified as a dust storm, though numerous squalls lifted soil in dust storm densities in very small areas. Throughout the great plains farmers were applying conservation measures to anchor the soil against the winds. While no major dust storms are anticipated for 1941, if drought conditions return dust storms will doubtless recur.

In the pastoral regions of Australia, where the rainfall rarely exceeds ten inches and where much of the range is greatly overgrazed, soil blowing is a severe problem. While no major dust storms were reported for 1940, western Australia experienced the driest season in 60 years and local blowing was noted in several regions.

The northern half of the Anglo-Egyptian Sudan, the Sahara and other arid and desert regions of Africa, as well as Iraq, the Gobi and similar desert regions of Asia, experienced the usual sa and dust storms. These were not unexpected, since such stor have become periodic in those regions. (*See* also DROUGHT; D FARMING.)

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(H. H. BE.)

Dutch Borneo: *see* BORNEO; DUTCH EAST INDIES.

Dutch East Indies, the largest colonial possession of t Netherlands and chief centre Dutch independent existence since the fall of the Netherlands b fore the German invasion, consists of a huge archipelago, wi several large islands, Java, Sumatra, Celebes and parts of Born and New Guinea, and many smaller ones, located near the equat from 6° north latitude to 10° south latitude. The archipelago south of the Philippines, south and east of the Malay peninsu and north of Australia. Capital, Batavia; Governor Gener Jonkheer Dr. A. W. L. Tjarda van Starkenborgh-Stachouwer, a pointed 1936. Area, 733,681 sq.mi.; population (1930) 60,73 025; estimate Jan. 1938, 65,000,000. The population (1930) w divided as follows: Java and Madura, 41,719,524; Sumat 8,238,570; Borneo, 2,194,533; Celebes, 4,226,586; rest of t archipelago 4,351,812. Largest cities: Batavia, 437,000; Sur baya, 313,000; Bandung, 167,000.

History.—A most important event affecting the position of t Dutch East Indies was the German conquest of the Netherlands May. The colonial administration announced its loyalty to t government of Queen Wilhelmina in London; German ships in t Indies harbours were seized and German residents of the arch pelago were interned. Thanks to Great Britain's mastery of t

JAVANESE TROOPS of the Dutch East Indies were taught the principles of an aircraft defence by Dutch colonial officers as the islands braced themselves 1940 for a threatened attack by Japan

seas, no question of an effective German attempt to occupy the East Indies arose.

A delicate situation came up, however, in connection with the relations between the Dutch colonial empire and Japan. There had previously been some disputes between Japan and the Dutch East Indies, mainly over the questions of restrictions on Japanese imports into the colony and the use of Japanese and Dutch ships in the carrying trade. Japan was in 1940 more interested in the East Indies as a source of strategic raw materials than as a market. A Japanese commercial mission headed by the Minister of Commerce and Industry, Ichizo Kobayashi, proceeded to Batavia to discuss the possibility of larger Japanese purchases of East Indies oil and other strategic raw materials. The situation was complicated because British and American oil interests control about 88% of the oil production of the East Indies; and America and Great Britain were pursuing a policy of restricting rather than expanding trade with Japan. The Kobayashi talks ended without the announcement of any definite agreement.

During the first eight months of the European war (Sept. 1939–April 1940) imports from Japan were 64,500,000 florins, as against 51,500,000 florins in the corresponding months of 1938–39. Exports to Japan during the same period were 27,900,000 florins, as against 14,300,000 florins in the eight months of 1938–39.

The Dutch administration strengthened its repeated announcements of intention to resist invasion by taking a number of measures for military and industrial mobilization and for increasing the air and naval strength of the colony. It is generally believed that elaborate measures have been taken to destroy the oil-wells in Borneo in the event of a Japanese attack.

Education and Religion.—There were about 2,000,000 pupils in the Dutch East Indies schools in 1938. The cost of the educational establishment was about 20,000,000 florins. Higher education for the natives is almost non-existent. Mohammedanism is the general religion of the peoples of predominantly Malay stock who inhabit the archipelago. There are about 1,000,000 Buddhists and a much smaller number of converts to Christianity.

Defence.—At the end of 1938 the colonial army of the Dutch East Indies consisted of 1,170 officers and 35,719 men. There was also a Dutch militia of 1,783 reservist officers and 13,265 men and a *landsturm,* composed of older Dutch inhabitants, suitable for home defence tasks, with a strength of 17,596. The fleet consisted of 3 cruisers, 9 destroyers, 14 large submarines, minelayers, minesweepers and a number of auxiliary coast defence vessels. It is unofficially estimated that there were about 500 aeroplanes.

Finances and Banking.—The unit of currency is the Dutch florin (53·1 American cents in 1939). The Dutch florin is not quoted in international exchange since the German occupation; but the Dutch East Indies florin has retained its original value. The Java bank is the bank of note issue in the colony and there were in 1940 several other banking institutions. Revenue in 1940 was estimated at 582,290,557 florins and expenditure at 654,582,465 florins. There was an all-around increase in taxes after the German occupation of the Netherlands.

Trade and Communication.—Imports in 1938 were 497,385,000 florins and exports were 714,323,000 florins. The principal exports in 1938 were: sugar, 1,077,825 tons; shelled coffee, 68,951 tons; tea, 71,921 tons; tobacco, 47,977 tons; petroleum products, 6,017,393 tons; rubber, 331,243 tons; tin, 26,549 tons. The first effect of the European war was to stimulate the foreign trade of the Dutch East Indies. During the period from Sept. 1939 through April 1940, exports were 597,800,000 florins, as compared with 443,100,000 florins in the corresponding eight months of 1938–39. Imports in the eight months of 1939–40 were 349,500,000 florins, as against 315,600,000 florins in the corresponding period of 1938–39. The German occupation of Denmark, Norway, the Netherlands, Belgium and part of France, and Italy's entrance into the war were unfavourable developments, as regards the foreign trade of the Dutch East Indies. Batavia is the oriental terminus of the Royal Netherlands Airways, the functioning of which has been stopped by the war, although air service in the archipelago continued in 1940. The Dutch East Indies in 1940 contained 43,450 mi. of highways and 4,620 mi. of railways, of which 3,387 were in Java and 1,233 in Sumatra.

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Dutch Guiana: *see* SURINAM.

Dyestuffs. Because of the unavailability of accurate statistics showing world dye production of coal-tar dyestuffs for the year 1939 (year of latest available figures) due to the war, figures are only given for the industry in the U.S.A.

Production in 1939 was 47% higher than in the preceding year, 43 manufacturers turning out a quantity of 120,190,688 lb. Sales were 30% by quantity and 32% by value above those in 1938. The increase shown for production in 1939 is much greater than that for sales because a considerable proportion of 1938 sales was made from stocks on hand. The inability of foreign producers to meet their export requirements has resulted in increased export business for American manufacturers. After satisfying the domestic needs, dye producers had a considerable surplus for export. The quantity exported was limited largely by plant capacity. This is indicative of the self-sufficiency of the United States as a colour-producing country.

Coal-tar dyes to the extent of 5,212,457 lb. were imported into the United States during 1939, representing principally colours that were not manufactured here because of patent restrictions and specialty products whose sales volume was not sufficiently large or important to warrant expenditures for manufacturing equipment.

There was a definite trend towards the increasing production of the higher quality dyes such as the fast vat colours. These are primarily of interest for application to cotton, rayon and linen. Improved technique in the manufacture and application of vat colours greatly aided the production of fast-dyed lines of merchandise. More dyed and printed fabrics were coloured with vat dyes than ever before. Research resulted in the development of a number of new dyes in 1939 and is constantly pointed towards the creation of colours possessing greater fastness combined with simplified application procedure. The 1925–30 average showed that vat dyes other than indigo represented 6·5% of the total. In 1939, this had grown to 14·6%. There is also an increasing demand upon the dyestuff manufacturer for dyestuffs capable of withstanding new treatments in the processing of fabrics, thereby allowing cloths of original design, finish and improved quality to be manufactured. (A. G. BN.)

Dykstra, Clarence Addison (1883–), U.S. educator, was born Feb. 25 at Cleveland, O. After graduating with a bachelor's degree from the University of Iowa in 1903, he taught at the University of Chicago (1903–04), at Pensacola, Fla. (1904–06), Ohio State university (1907–09) and the University of Kansas (1909–18), where he became chairman of the department of political science. Temporarily deserting his academic career, Dykstra in 1918 became executive secretary of the Cleveland, O., Civic league. After serving in similar offices at Chicago and Los Angeles, he returned to teaching at the University of California from 1923 to 1929.

The next year he was selected as city manager of Cincinnati, an office he retained until he was chosen as successor to Glenn Frank (*q.v.*) as president of the University of Wisconsin in 1937. On Oct. 12, 1940 Dykstra accepted the position of director of selective service after the University of Wisconsin had granted him a leave of absence. The senate confirmed his appointment Oct. 15 and he was sworn in two days later, shortly after the national registration for military service. On Oct. 20 Dykstra announced that arrangements for the draft lottery were complete. On Nov. 19 he pledged the assistance of the government in safeguarding the jobs of men called up for military duty under the Selective Service act.

Ear, Nose and Throat, Diseases of.

Ear.—"Hearing Acuity and Stammering" was analyzed by Harms and Malone. They stated that speech defects in pupils of elementary grades have been estimated at from 4% to 18%, which meant that 1,000,000 children had defective speech. Speech involved a mental motor mechanism and a proper receiving mechanism, therefore defective hearing was a legitimate cause for defective speech.

These authors emphasized the importance of testing the hearing acuity of all school children before the end of the first grade, claiming that it was as important as the visual acuity tests. At this early age any existing pathologic condition in the ear or speech mechanism might be cared for. They found stammering to be rare in cases of total loss of hearing, and more frequent in those with approximately 50% loss. The relation between stammering and partial hearing loss became more suggestive.

Voss contrasted "Old and New Views on Otosclerosis" citing the fact that the name, denoting hardening or thickening of the tympanic membrane, was hardly a consistent term. Histologic research revealed that in otosclerosis there occurred a change in the individual parts of the bony capsule, compact bone being replaced by spongy, hollow spaces and that this did not represent a simple transition, but the production of new surplus material extending over the old in tumour fashion. Several sites in the ear and temporal bone seem to be subject to such changes. One special area is in the bony structures in the region of the oval window, which if connected with the base of the stapes (stirrup—one of the three small bones of the middle ear) would cause a binding of this bone to the oval window, the binding being termed "ankylosis," with consequent considerable sound conduction disturbance so that sound could no longer be well transmitted to the labyrinth. Such areas have been seen to arise in other parts; *e.g.*, the cochlea, round window, or along the auditory nerves, with or without involvement of the stirrup base, but thus far it has not been proved that the labyrinth affection was not directly connected with bone disease, though inner ear disease with stirrup ankylosis strongly suggests a possible otosclerotic origin.

Baer presented a paper on "Otitis Media and Dietetics," claiming that inflammatory changes in the middle ear were due to infection while chemical and physical factors usually affected the inner ear; that the virulence of the bacterial element varied greatly in different localities and conditions and that metabolic changes favoured the outbreak of infection. A poor evaluation of dietetics predisposed the body to infection and subsequent middle ear infection. In discussing the various vitamin deficiencies he emphasized the value of a balanced dietary with normal vitamin intake for individual requirements in infection of the middle ear structures.

"Deleterious Effects of Noise in Industrial Pursuits" was presented by Weyrauch. He restated the well established fact that continued noise often caused lowered hearing, frequently leading to varying degrees of nerve deafness. Autopsy findings and animal research have proved the truth that intense noise can completely destroy the organ of Corti (nerve endings in the inner ear which transmit impulses to the auditory nerve and thence to the centres of hearing in the brain) in the cochlear duct.

It has been found that typists using dictaphones showed a marked depreciation of normal hearing in from one to three years. A large percentage of accidents have been caused by noise, first, because the worker was deafened by the noise and second, because the warning sounds were not heard when submerged in prevailing noise. The practical value of protective measures to prevent deafness among railroad and industrial workers has not as yet been proved.

Selfridge presented several papers dealing with certain nutritional pha in relation to the auditory nerve. His observations led him to conclude t degenerative changes in the auditory nerve as found in various disease a toxic conditions related to neuritis might have as an underlying ba nutritional deficiency, and that sufficient thiamin chloride should be giv which doses should be controlled by the urinary tests instead of by estir tion. In addition to adequate vitamin intake, it is necessary to care any endocrine dysfunction. He emphasized that vitamin deficiency sho be considered as a factor of some importance in the mechanism that p duces degenerative changes in nerve endings. (*See* also DEAFNESS.)

Nose.—Dr. Arthur W. Proetz, professor of clinical otolaryngolo Washington university, St. Louis, conducted numerous experiments on physiology of th nose, throat and ear, with especial reference to the act of the mucous membrane lining, the cilia, the cells and kindred structures.

A good many years ago he undertook the study of filling certain sinu with radiopaque solutions and having X-rays made. He found that could fill the ethmoid and sphenoid sinuses (air spaces in the ethmoid a sphenoid bones) adequately so that any abnormal condition that might present in these spaces could easily be delineated. At the same time studied the effects of certain solutions introduced into these sinuses in lation to the promotion or retardation of ciliary activity. He soon fou by animal experimentation, that certain drugs stimulate the function the cilia, whereas others depress or damage the cilia. In 1931 he publish his first work on this subject, entitling it *The Displacement Method of Si Diagnosis and Treatment*. The method has been widely used by rhinologi the world over. The author kept careful records of his observations, a collected the opinions of rhinologists everywhere. He continued his obser tions and in 1939 published the second edition of his famous monograph.

Larynx.—The perfection of rapid colour motion picture films has ma photographs of the moving larynx in colour possible, and many lar gologists have successfully produced motion pictures of the larynx. Wh thrown on the screen, one can clearly see the laryngeal structures and th function, both in health and during the various diseased states. Moti picture photography of the larynx in colour will become a valuable aid teaching methods because it presents the living larynx exactly as it wor in the body, without distortion as seen in the mirror, invaluable as t latter examination may be. All of the above points have been expounded Gabriel Tucker, professor of bronchology and oesophagology and profess of broncho-oesophagology and laryngeal surgery, in the school of medici and the graduate school of medicine, respectively, University of Penns vania, and many others.

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Earthquakes: *see* DISASTERS; SEISMOLOGY.

East Africa, British: *see* BRITISH EAST AFRICA.

Economic Association, American: *see* AMERICAN EC NOMIC ASSOCIATION.

Economic Geology: *see* GEOLOGY.

Ecuador,

a South American republic straddling the equat and the Andean plateau on the Pacific coas language, Spanish; capital, Quito; president, Dr. Carlos Arroy del Río. The area, including the Galápagos islands (2,400 sq.mi is 337,392 sq.mi., according to Ecuadorean claims, but over 100 000 sq.mi. are disputed with Peru. In the lack of any census th population is variously estimated at from 2,500,000 to 4,000,00 with 3,500,000 probably a fair approximation. The chief citie are: Quito, 140,000; Guayaquil, 120,000; Cuenca, 42,000; Ri bamba, 21,200.

History.—The year 1940 in Ecuador was marked by politic unrest and uncertainty arising from an economic depression whos roots lay in the European war's disruption of world economy an in overproduction of Ecuador's principal export commodities. O Jan. 11, former provisional president, Dr. Carlos Arroyo del Rí (who had resigned on Dec. 11, 1939 to enter the election cam paign) was elected constitutional president. Refusing to accep the official election verdict, however, partisans of Dr. José Marí Velasco Ibarra, former president and Independent candidate, at tempted a coup d'état (Jan. 12), but Pres. Andrés Córdova wa able to suppress the movement within a few hours. Velasco wa shortly expelled to Colombia. Further revolutionary plots later i the month, in March and in July were nipped in the bud an Pres. Arroyo took office Sept. 1.

By mid-1940 totalitarian propagandists and fifth columnist

were so active that in June formal government investigation began. Two focal points of propaganda, an Italian military mission and the economically unprofitable German-Ecuadorean SEDTA air line, were eliminated by government action which replaced the Italian mission with one from the United States and ousted the German employees of SEDTA. Popular protests over presence of several Japanese "oil explorers" near Esmeraldas in June forced their expulsion. Elimination of propagandists and fifth columnists, to the extent that it was successful, was largely the achievement of a senate committee headed by Senator Filemón Borja, spearhead of an anti-totalitarian movement.

Ecuador gave strong support to the western hemisphere defence program of the Havana conference (*see* HISPANIC AMERICA AND THE EUROPEAN WAR). Reports that naval and air base rights in the Galápagos islands would be granted the United States were rife during the year, but generally met with popular disapproval. The chronic boundary dispute with Peru, regarded by many as potentially the most malignantly sore spot in inter-American relationships, was relatively dormant in 1940 despite some frontier frictions.

Trade and Communication.—External communication is by sea and north and south by air. Almost all exports except petroleum go through Guayaquil. Internal communication is by railways (over 600mi. in length), a 3,500mi. main highway system and the Guayas river. In 1940 $900,000 from a United States Export and Import bank loan was allotted to new highway construction.

In 1939 imports of 147,860,000 sucres value (principally foodstuffs, machinery, textiles and miscellaneous manufactures) came chiefly from the United States, 48·7% (1938: 34·6%); Germany, 18·1% (1938: 24·1%); Great Britain, 5·5% (1938: 7·7%); Japan, 5·3% (1938: 7·4%); France, 5% (1938: 4·4%); Italy, 3·1% (1938: 3·1%); Peru, 2·6% (1938: 1·4%); Cuba, 2% (1938: 2·8%). In the first seven months of 1940, 56·2% of imports were from the United States. In 1939, exports, 164,841,000 sucres were taken by the United States, 49·1% (1938: 37·5%); Germany, 6·8% (1938: 17·5%); France, 6·6% (1938: 8%); Uruguay, 5·3% (1938: 5·4%); Japan, 3·9% (1938: 2·4%); Great Britain, 3·7% (1938: 4·7%); Peru, 3·5% (1938: 7·4%); Colombia, 3·2% (1938: 1·3%); Chile, 3% (1938: 3·8%). The principal export commodities were: cacao, 20·2%; cyanide precipitates, 16%; petroleum products, 15·1%; gold and silver (in bars and coin), 8·1%; and coffee, 3·4%. In 1939, 13,277,808kg. of cacao, the principal export crop, was exported, 21·3% less than in 1938. The 1940 crop was estimated to be 30% less than that of 1939, exports were 40% less. Petroleum production was 2,354,370bbl. in 1939 and 2,475,000bbl. (est.) in 1940. Petroleum and cyanide production is almost entirely in foreign hands and export values contribute little to national economy. Coffee, valued in 1939 at only 42·8% of the 1937 price, continued low in 1940, but the outlook was materially improved by the Inter American Coffee Quota agreement of Nov. 1940, which allotted Ecuador 150,000 bags of 60kg. each for export to the United States (1938: 68,434 bags). The 1939 coffee crop was 205,333 bags, 6% greater than in 1938.

Finance.—The monetary unit, the sucre, was valued at $6\frac{2}{3}$ cents U.S. in Dec. 1940, after a recovery from a low of $4\frac{1}{2}$ cents in late April. The 1941 budget called for 125,902,000 sucres, with 21·5% to national defence, 7·4% to education, against 121,875,000 sucres in 1940.

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(L. W. BE.)

Eden, (Robert) Anthony (1897–), British statesman, was born June 12 and was educated at Eton and at Christ Church, Oxford. After service in the World War (1915–18), he contested the Spennymoor division of Durham in 1922, and in the following year he was elected for Warwick and Leamington, which he thereafter continued to represent. From 1926 to 1929 he was parliamentary private secretary to Sir Austen Chamberlain. He then became under-secretary for foreign affairs and, in 1934, lord privy seal and a privy councillor. In June 1935 he entered the cabinet as minister without portfolio for League of Nations Affairs, holding this post until the following December, when he became foreign minister. Disagreement with Prime Minister Chamberlain over the latter's policy of "appeasing" Germany and Italy led to his resignation Feb. 20, 1938. Upon the outbreak of war Sept. 3, 1939 he re-entered Chamberlain's cabinet as dominions secretary.

In Feb. 1940 Eden made a tour of inspection through the middle east and welcomed the first Australian and New Zealand troops arriving at Suez. On May 11 he was named secretary of state for war in Winston Churchill's new cabinet. In October he again inspected British defences in Egypt and Palestine and held a series of conversations with Gen. Wavell, commander of British forces in the middle east, during the course of which plans were undoubtedly perfected for the lightning British counteroffensive in North Africa which began Dec. 9. On Dec. 22 announcement was made in London that he would succeed Viscount Halifax, new ambassador to the U.S., at the foreign office; his official appointment took place the next day.

Edey, Birdsall Otis (1872–1940), U.S. Girl Scout leader, was born in Bellport, N.Y., June 25. She was active in the movement for woman suffrage, and when women won the right to vote she decided to devote herself to the Girl Scout movement. She was elected scout commissioner for the borough of Manhattan in New York city in 1919 and in 1930 she became president of the national organization, holding that post until 1935, when Mrs. Herbert Hoover was chosen to succeed her. She was then made national commissioner and became chairman of the International committee in the United States, a post which she held at the time of her death in New York city on March 17. She was the author of two volumes of poems.

Education. The year 1940 was marked conspicuously by wide publication on and discussion of U.S. education and its place in U.S. democracy. No year in the recent history of the country witnessed such an emphasis upon this subject, due to the collapse of democratic governments in Europe and the threat to the American way of life. Many proposals were made, especially during and after the summer months, to spend increasingly of the national resources for arming against anti-democratic conditions and tendencies, within as well as without the schools. The conviction seemed to grow during the year that education had reflected shallowness both in quantity and quality, and that if it was to regain the public esteem which it once enjoyed it would have to improve its quality; and that if it was to become in reality a defence for democracy it would have to direct the energies of the nation into those channels which would lead to reasonably effective action in U.S. life. Educators seemed generally to have agreed that the most important question facing them, if democracy was to survive, was to make education in the United States seriously undertake the task of defending and extending the democratic way of life. The question which they asked was: "How can we create a bold, comprehensive and adequate program in our schools and communities throughout the nation?"

Education and National Defence.—On this subject there was prompt, wide and energetic activity, especially after the fall of France. A committee representing 55 national educational organi-

zations met in Washington in early September for the purpose of mobilizing the educational resources of the nation in the interest of national defence. Meeting as the operating committee of the National Coordinating Committee on Education and Defense, which had been organized early in Aug. 1940, under the auspices of the National Education association and the American Council on Education, the group outlined general plans to make available and to co-ordinate all educational facilities needed for national defence purposes. Willard E. Givens, executive secretary of the National Education association, and George F. Zook, president of the American Council on Education, were elected co-chairmen of the organization, and L. H. Dennis, executive secretary of the American Vocational association, was named secretary. The activities of the group included immediate and continuous representation of organized education for effective co-operation with the National Defense council, the Federal Security agency and other governmental departments and agencies; the stimulation and co-ordination of the efforts of educational organizations and institutions in projects related to national defence; dissemination of information regarding defence developments to educational organizations and institutions; and the maintenance and improvement of educational opportunities essential in a long-range national program.

On June 23 congress appropriated the sum of $15,000,000 for a summer training program in schools and colleges for workers essential to national defence industries. By Oct. 31, 242,000 workers had been enrolled. The emergency program appropriation of $15,000,000 with an additional $26,000,000, was intended to promote the work through October. Later, congress appropriated $60,500,000 in the supplemental appropriations bill to provide for the training in vocational schools, rural schools, high schools, colleges and universities of more than 700,000 youths and adults as workers to speed up defence industries and governmental services by June 1941. By the autumn the work inaugurated in July was in operation in nearly every state in the union, Puerto Rico, Hawaii and the District of Columbia. The revised program included the continuation of the work begun in the summer; short courses in colleges and universities of engineering to meet the shortage of engineers in fields essential to national defence; training of rural and non-rural youth for national defence; and vocational or related or necessary instruction for young people employed on work projects of the National Youth administration. Numerous conferences held during the year by officials of the United States Office of Education and other leaders emphasized the importance of developing training programs in vocational and technological fields. To this end the United States Office of Education worked closely with the National Defense Advisory commission, war department, navy department and other agencies of the government.

U.S. School and College Enrolment, 1934, 1936 and 1938

Day Schools (Summer Sessions excluded)

	1934	1936	1938
Elementary:			
Public	20,880,120	20,495,767	19,842,744
Private	2,382,251	2,274,584	2,263,703
Total	23,262,371	22,770,351	22,106,447
Secondary:			
Public	5,715,608	6,020,268	6,269,723
Private	380,880	415,435	477,951
Total	6,096,488	6,435,703	6,747,674
Colleges and Universities[1]			
Public	529,931	614,131	689,483
Private	525,429	594,096	661,422
Total	1,055,360	1,208,227	1,350,905
[1]Includes junior college enrolments of:	Public	Private	Total
1934	55,869	22,611	78,480
1936	70,557	31,896	102,453
1938	82,041	39,469	121,510

Statistics compiled by U.S. Office of Education, Federal Security Agency, 1940.

The Educational Policies commission of the National Edu tion association and the American Association of School Adm istrators, which was established in 1935, continued its use publications and other activities in an effort to define guidi principles for education in the United States. Publications cluded the development of an educational program in relati to national defence as set forth in important documents includi *For These Americas; Education and the Defense of Americ Democracy; Learning the Ways of Democracy: A Case Book Civic Education;* and *Education and Economic Well-Being American Democracy.*

In August, the faculty of Teachers college, Columbia univ sity, issued a manifesto under the title "Democracy and Edu tion in the Current Crisis," a document which, discussing meaning of democracy, the gravity of the present situation, assets of the United States, and setting out "a creed of dem racy," was widely circulated and discussed throughout the cou try. All possible aid to the national defence program was pledg by higher educational leaders as their colleges and universit opened in September. A surge of patriotism appeared in convo tion addresses by the heads of these centres of learning whi were declared to belong in a real sense to, and obligated to h themselves in readiness to serve, the nation, especially in times emergencies.

At its annual meeting in August, the American Federation Teachers strongly endorsed a platform calling for an adequate r tional defence, protection of labour standards, adequate rep sentation of labour in plans for national defence, the rapid a sorption of the unemployed, preservation of social security la and the maintenance of educational standards of academic fr dom and preservation of civil liberties as "integral factors in r tional defence," and re-elected Prof. George S. Counts, of Tea ers college, Columbia university, as its president.

Court Decisions.—During the summer a circuit court of a peals sitting in Asheville, N.C., reversed the decision of a low court in the case of a Negro teacher who brought action agai the school board of Norfolk, Va., alleging an infringement of t constitutional right and discrimination against the Negro teac in the matter of salary. The original suit was lost by the Neg who appealed the case. In reversing the decision of the low court, in which the allegations had not been proved, the circ court of appeals stated emphatically that if the allegations we true—if the Negro teacher did receive a smaller salary than white teacher with the same type of teaching certificate—t practice constituted discrimination and a violation of the 14 amendment to the constitution of the United States. The sch board of Norfolk appealed the case, and in October the suprem court refused to review the decision of the circuit court. T decision of the highest court had direct bearing upon practic of teachers' salaries in many states.

Early in June the supreme court of the United States affirm the right of a Pennsylvania school board to expel children w refused on religious grounds to salute the United States flag. T case involved two children, brought up in the teachings of a re gious sect known as Jehovah's Witnesses, who maintained th saluting the flag was a violation of the Second Commandme The federal district court for the Eastern district of Pennsy vania gave a decision in favour of the children and ordered th they be reinstated. The local school board appealed to a circ court of appeals which upheld the decision of the lower cou But both of these courts were reversed by the supreme court the United States by a decision of eight to one, the majori opinion being written by Justice Frankfurter and the dissenti opinion by Justice Stone.

The Commission on Teacher Education.—This agency of t

HIS STANDARD LESSON for British school children shows what to do in case f an air raid

merican Council on Education, appointed in 1938 for a period of ve years, continued its co-operative study of teacher education n connection with 20 higher educational institutions and 14 school ystems, for the purpose of improving the pre- and in-service reparation of elementary and secondary school teachers. Through staff of 10 persons under the directorship of Karl W. Bigelow, ne commission has been providing consultant and other services o that end. In addition to the staff of the Washington office f the commission a collaboration centre was maintained at the Jniversity of Chicago for the study of child development and eacher personnel. During 1940 the activities of the commision were extended to include the pre- and in-service preparaion of college teachers. A representative of the commission isited those graduate schools whose Ph.D.'s go into college teachng and undergraduate colleges that are actively promoting the inervice growth of teachers. During the summer the commission onducted a workshop at the University of Chicago where repreentatives of the 34 institutions and school systems associated in ne study of teacher education worked on special subjects. Types f materials developed from the Chicago workshop included deailed results of the evaluation device produced by the Committee n Evaluating the Workshop, some of the addresses given at the orkshop, and the daily minutes of some of the various groups nat comprised the workshop, and the procedures of the underaking.

The American School of the Air.—In October this organization egan its 12th year of service, under the new title, School of ne Air of the Americas. This educational feature, which was riginated by the Columbia Broadcasting system in 1929 and in hich the National Education association has co-operated since 938, will be heard during the school year 1940–41 in more than alf of the republics of the western hemisphere. The Canadian roadcasting corporation made the programs available to all chools in the dominion. In Canada and in the republics which reeived the programs, the English language was used; in other ations the programs were translated into Spanish or Portuguese nder the direction of the ministers of education. These educaonal programs were strongly endorsed by Secretary of State ordell Hull as a feature of the exchange of cultural relations beween the Americas, for the purpose of deepening and broadening nderstanding between the peoples of the American republics.

A vigorous program of action in behalf of democracy for the children of the United States was formulated by the White House Conference on Children in a Democracy, which was held in Washington in January. The program was the culmination of studies that had been in progress since the organization conference was held in April of 1939. Similar conferences had been held previously; one at the call of President Theodore Roosevelt in 1909, another at the call of President Woodrow Wilson a decade later, and another called by President Herbert Hoover in 1930. The 1940 conference was sponsored by President Franklin D. Roosevelt. Numerous recommendations, drafted in reports of subcommittees composed of welfare workers, educators, religious and civic leaders and others, were approved by the conference.

The Eighth American Scientific congress was held in Washington in May and was attended by numerous delegates from the United States and several South American countries. The section on education was in charge of President Nicholas Murray Butler and Professor I. L. Kandel of Columbia university.

In the annual report of President Raymond B. Fosdick, of the General Education board, announcement was made that that foundation was in process of liquidation and within a few years its remaining funds would be entirely exhausted. At the time of the announcement it was pointed out that since the founding in 1902 of the General Education board, by John D. Rockefeller, Sr., the foundation had granted more than $265,000,000 for various educational projects. When the foundation was established, its first activities were in the southern states where the career of the foundation will end—in the same "area where the need is still great and where significant and promising developments are underway."

The establishment of a university centre in Atlanta, Ga., was finally assured by the conclusion of a successful campaign for funds totalling more than $7,500,000. The plan is to co-ordinate the services of six educational institutions in and around Atlanta, for the purpose of elevating scholastic standards, increasing facilities for research and graduate study, and eliminating duplications in essential courses. Participating in the university centre are Agnes Scott college and Columbia Theological seminary at Decatur; Emory university, the Georgia School of Technology and the Atlanta Art association, at Atlanta; and the University of Georgia at Athens. There will be no mergers among the schools, but a co-operative program will be developed by an advisory committee representing all the institutions. Funds for the project came through private gifts and public subscriptions, amounting to $5,000,000, and a grant of $2,500,000 by the General Education board. (*See* also ACADEMIC FREEDOM.)

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British Empire. — The influence of war on education could not at the close of 1940 be fully estimated. The scheme of reorganization on which all countries of the British commonwealth had embarked had to be largely suspended in all aspects which demanded and increased expenditure. The

reorganization of methods, curricula and the whole tenor of school life was continued with the same vigour in spite of the war. As the New Zealand latest report says: "Yet ultimately the effects of the war on the schools may be deeper than any of the external changes can strike. There is amongst all concerned with education a growing realization that it is in the schools that future citizens must not only learn how democracy works, but must also develop a passionate belief in the fundamental human values for which democracy stands." The common trends in educational development in democratic countries were well summed up by the minister of education in New Brunswick: (1) there is a striking tendency for pupils to remain longer in school and in ever increasing numbers complete the work of the secondary grades; (2) the widespread adherence to the belief that "we are never too old to learn" led to an extension of adult education in a wide variety of forms; (3) the significant and constructive studies of rural education have resulted in an adoption of the larger unit of administration with a reorganized basis for the financing of rural schools. In this respect the Nova Scotia *Report on Rural Education, 1939,* gives a comparative survey of general trends in the English speaking countries.

Canada.—The federal grant for youth training was continued in 1939 and 1940. In Quebec a new normal school was opened at Amos and thus all the regions were now provided with centres of pedagogical training. The trial of the new course of study introduced in 1938 resulted in the raising of the entrance standard to normal schools by two years. Special courses in drawing, agriculture and household science were organized for teachers in 1939, and a special pedagogical library was instituted. In Ontario new courses of study were issued for grade XI in Sept. 1939, thus completing the reform of the curriculum. The consolidation of rural areas was continued in 1938, doubling the total number of consolidated townships to 28. In New Brunswick the first six grades of the new curriculum were authorized for general use in Sept. 1939. It outlines for the teacher a sound approach to child development. The new program for the upper six grades was being experimented with by selected teachers and was to be introduced as soon as possible. The first rural high school was founded at Bayside. In 1939 an act was passed for the establishment of a provincial council of education. In Prince Edward Island the curricula in agriculture and nature study were revised on the basis of the child as a centre of training in terms of activity and experience. In British Columbia drama and oral expression were introduced in grade XII in 1939. Progress cards similar to Dalton Plan cards used in England were introduced in 1939. In Saskatchewan the committees were revising the courses of study but had not reported by the autumn of 1940. In Manitoba the legislature voted $10,000 for scholarships in order to equalize the opportunities for higher education. Grade XII was reintroduced in 1939, being in suspense from 1932.

New Zealand.—The policy of the government to secure for every child free education adequate to his needs was continued in 1939. Sixty-four per cent of the children leaving primary schools went on to post-primary schools which offered a wider range of alternative courses than ever before. The consolidation of rural schools largely met the needs of the country children. More attention was given to music, drama, arts, physical skills of all kinds and independent reading. A new superintendent of physical education was appointed in 1939, who introduced a system of training based on the syllabus of the English board of education. Two new intermediate schools were opened.

South Africa.—The problem of dual control continued to be the subject of discussion between the Union minister of education and provincial directors. The Union insists on a greater development of vocational education which is under its control and accuses the provinces of paying too little attention to differentiation of curricula according to abilities. The superintendent of the Cape province answered the criticism in his report of 1939. The Cape education department celebrated its centenary by an issue of *Education Gazette* containing texts of historical documents. In Pretoria the laying of the foundation stone of the Voortrekker memorial served as a centre of many educational activities. Other features in Transvaal were the continued centralization of rural schools and the establishment of nine junior high schools which will play a similar role in urban districts to that of school farms in rural areas. They are pre-vocational two-year schools—preparing for technical and commercial schools under the Union. The transfer of two agricultural schools from the Union to the province proves that in Transvaal at any rate the dual control is no obstacle to co-ordination of the two systems.

Australia.—As the minister of education in Western Australia said in his report: "The need for federal aid to education is increasingly urgent. In this way only can reforms be effected that will bring it into line with modern developments in educational practice and enable it to meet satisfactorily the requirements of all sections of the population." However, the absence of federal aid did not stop the progress of Australian education. In Victoria many new buildings were erected and all services were extended. There was an increasing demand for secondary education in country districts. It was strikingly illustrated by the development of bus services bringing pupils from rural schools to centres of secondary education. New post-primary courses were established in six centres. Woodwork and sheet-metal courses for boys and needlework and cookery courses for girls were provided in all centres. In Western Australia the consolidation of rural schools was continued which resulted in the steady increase in the numbers of pupils remaining in the higher classes of post-primary schools. In Tasmania the development of area schools was continued, four new schools being added in 1939. In Queensland the amended syllabus of 1938 proved to be an improvement as it is better adapted to the mental ages of the children. The development of initiative and resourcefulness is directly fostered through the "purposive activity" of the pupils.

British India.—India was just in the committee stage of a radical re of her system of education. Great attention was being paid to the exte of girls' education and attracting women to the teaching profession. United Provinces provided a special fund for 150 women teacher primary mixed schools in recognition of the fact that women are the teachers of small children of both sexes. The Wardha scheme promul by Mr. Gandhi was a central subject of discussion in all provinces. Gan view that Indian education should be based on rural occupations and tional training found support even among British educational exp There was a noticeable increase in numbers in post-primary grades in girls' schools during the last two years.

BIBLIOGRAPHY.—*The Year Book of Education* (1940); *Annual Re* of all the dominions, provinces and states of Canada, Australia, New land, South Africa, Eire, British India. (N. H

General World Trends.—The war continued to take its destructive in the field of education during the year 1940. Marching armies and b ing aircraft destroyed school buildings, scattered children and teachers, caused many casualties among them. Forty professors of the Polish versities alone died during the year, half of them, however, as the r of harrowing experiences in concentration camps. The expulsion of populations from some lands and the exchange of nationals between o resulted in an almost complete stoppage of education in large areas the countries ravaged by German armies in 1939 there was some re struction; in those invaded by German armies in 1940 there was destruction. Because of the need of mobilizing for national defence in European countries, combatant and neutral, the universities were lar denuded of students. In all save a few nations the expense of maintai armies and navies caused a marked reduction in the amounts provided schools. Guns have not only been preferred to butter but they have more been preferred to schools.

Number of British Commonwealth Scholars in 1938–39

Country	Population 5–20 years in 000's	In primary schools	In secondary schools	In vocational schools	In private schools	In universities and colleges	Percent of tota schola to pop
England & Wales*	9,530	5,091,975	470,003	1,361,310	400,000	91,258	78
Scotland*	1,200	629,315	156,645	174,151	14,000	19,037	83
Northern Ireland	340	191,862	14,083	22,998	3,000	1,590	70
Canada	3,250	1,802,256	352,342	108,828	50,725	49,142	73
Australia	1,866	826,027	113,525	103,911	243,331	13,449	70
New Zealand	400	206,125	30,638	29,499	33,508	5,979	76
South Africa (Europeans)	590	281,413	103,036	41,044	26,096	14,607	79
Eire *	860	481,599	35,890	72,521	2,034	6,136	70
British India*	97,740	10,541,790	2,496,826	276,986	711,656	118,780	14

*For 1937–38.

The war had an increasingly profound effect upon the aims and met of education. Almost everywhere there was the demand for more prac education, for activities that would assist in the national defence. Phy training received emphasis in all countries, manual training in coun like China, shut off or partially shut off from the rest of the world blockading armies and navies. Agriculture, medicine, engineering technical subjects were preferred in universities as against academic cou The splendid adult education movement in the Scandinavian coun and Finland, however, was almost destroyed, save in Sweden, and it seriously modified in Sweden. This led to an increased respect for, expansion of, correspondence courses. Practically in every country the resulted in a marked increase of nationalistic feeling.

The reaction to conquest by invading armies was markedly differen the various conquered countries. In China, where life was badly disru the determination to remain free resulted in the repeated trek of univers from their original situs in eastern China to places in western China. M over, the Chinese universities were inspired by new and forward-loo ideals which have already produced far-reaching effects in elevating st ards, quickening interest in primary and adult education and stimula students to organize the people in relief and in social services. In conqu France, on the contrary, apathy and a feeling of despair pervaded country. Reactionary influences control, as they do wherever the Germ have conquered. The republic was abolished and the inspiring word the revolution, "liberty, equality, fraternity," gave way to "work, d pline, fatherland." The laws restricting religious schools were repea emphasis was placed upon moral and civic education, history textbooks revised, and the new system is characterized by an antagonism to humanism and secularism that formerly prevailed. The most inspi belligerent country educationally, as in so many other ways, is Great Bri which remained unconquered. Attendance at educational institutions appropriations for their maintenance actually increased during 1940.

One of the most conspicuous results of the war was the exodus of sc ars from the war areas to lands where they might work in peace and s rity. This was particularly true of the countries overrun by the Ger armies during 1940. No such migration of scholars has taken place s the revocation of the Edict of Nantes by Louis XIV in 1685. Many so and found refuge in the United States and had a hospitable recept The loss to the war-ridden areas of so much creative talent that wil needed for reconstruction purposes after the war and the gain to United States of the use of their great abilities can hardly be over mated. (S. DN.

Nursery Schools.—The latest office of education survey (1936), 285 nursery schools in the United States. But this figure is far under actual figures since a 1940 survey shows 283 private schools for yo children from two to six years in Massachusetts alone. The typical range of nursery schools is two to five years. Half are in full-day half in half-day session. In addition to the primary service given child schools function as centres for research, teacher training, parent ed tion and, in public high schools, as laboratories for pre-parental trai in child care and family relations. The high professional training of nur

chool workers is shown by the fact that 82% have bachelor's or higher egrees.

Many new housing projects, both federal and private, include nursery acilities in their planning. Welfare agencies for many years have been con-erting day nurseries into nursery schools with trained staffs. The Work 'rojects administration report as of June 1940 shows 1,364 emergency ursery schools with 39,853 children enrolled in 48 states. State and local ontributions to their maintenance are increasing.

(*See* also EDUCATION, ADULT; EDUCATION, ELEMENTARY; EDUCATION, 'ROGRESSIVE; EDUCATION, SECONDARY; EDUCATION, VOCATIONAL; UNI-ERSITIES AND COLLEGES.) (J. E. A.)

ducation, Adult. In common with other institutions and activities throughout the world depend-nt upon freedom of action, adult education encountered in 940 a year of curtailment. Following annihilation of the move-ıent in Czechoslovakia and Poland as a result of German parti-ion and occupation, the strong Finnish movement was crippled y Russian invasion. The exigencies of the brief but costly war-are that followed caused a natural preoccupation with material efence, but at no time did Finland lose sight of its free adult ducation as a necessary and vital concomitant of democratic rocesses. The Finns continued to publish their adult education eriodical and relied upon adult education as one means toward ational rehabilitation.

The subjugation by Germany of Norway and of Denmark resents a less encouraging outlook from the point of view of dult education. Denmark, cradle of the folk high school move-ıent, existed in 1940 under a system of sufferance accorded by lien military authorities. Information received despite military ensorship indicates that certain folk high schools have closed. t would be safe to conclude that those which might continue ere operating either so circumspectly as to destroy their effec-iveness or that outright attempts were under way to convert ıem to propaganda uses. In Norway, with a much less well eveloped system of adult education, similar conditions are be-eved to obtain. In Sweden, effort was made to conduct the folk igh school, study club and co-operative movements as usual. he constant threat of military power to be exercised either by ussia or Germany was undeniably an unsettling factor. The wedish institutions, however, carried on.

In Holland and in Belgium under German occupation it is un-kely that any vestige of the pre-war adult education activity emained. Strict censorship prevailed and the right of public as-emblage was abridged, both factors inimical to free adult edu-ation. In France, which never possessed an organized adult ducation movement, such small efforts as were supported by rganized labour succumbed to the twin evils of German occupa-ion and a pro-fascist post-war government.

In South Africa, India and China, mass education movements or adults, mostly on the elementary level, were seriously inter-upted by war. In Japan, complete defection of representative overnment and replacement by dictatorship indicated the end f adult education efforts for the present.

The nations constituting the British commonwealth all suffered ecreases in their adult education programs, the cause lying in he urgent war-occasioned need to devote money and energies to irect defence. However, the extent to which the British people ere able to preserve their democratic forms and allied educa-ional interests is remarkable. The degree of loss, of course, was ommensurate with actual nearness to the theatre of conflict. But even in the face of continual bombardment, Britons con-inued to study and to discuss. The scope of discussion included ıot only social and governmental questions but the arts—paint-ng, literature, drama and music. Certain new activities were tarted, devised particularly for workers in war industries. The ıavy educational program, in considerable part organized on a asis of correspondence instruction, flourished. The army and ir force programs were less successful. The British Institute of Adult Education was in 1940 carrying on an active program in co-operation with other organizations, both private and governmental. Activities in Australia and New Zealand continued but were somewhat handicapped by lack of funds. In Canada, the Canadian Association for Adult Education increased its efforts with the civilian population and in addition assumed important responsibilities in connection with the armed forces. Its series of bulletins dealing with war and defence issues was a notable contribution.

In the United States, adult education in 1940 allied itself with the paramount issue of national defence both in the materialistic and in the cultural sense. The annual meeting of the American Association for Adult Education dedicated itself to the doctrine that the democratic way is in truth an educational process. Close co-ordination of the adult education program of the U.S.A. was effected with the national, state and local defence committees. Proffers of assistance to the army and navy were made. Attention was given to the need for vocational training in order to supply war industries. Increased emphasis upon study and discussion groups resulted in a widespread demand for materials of instruction related to defence issues. Preparation of these materials on several levels of difficulty was begun. Forum activity was not permitted to diminish. Increases in the number of state and local organizations for adult education were noted, and the number of state and regional conferences was augmented.

Decreases in the relief program of adult education were offset in some degree by the assumption of new responsibilities by the tax-supported local school systems. The burden upon the private voluntary agencies increased.

BIBLIOGRAPHY.—Series on the *Social Significance of Adult Education in the United States*, 27 vols. (1937–40), pub. by American Association for Adult Education, New York. (M. A. C.)

Education, Elementary. The year 1940 brought further impetus to the growing movement to make education an instrument of national policy. Previously most of the totalitarian states had so organized learning for the childhood years that those future citizens came to believe fervently in the national aspirations and the ethical principles of their fatherland. Education for those "totalitarian" children did not primarily emphasize the development of whatever unique qualities they might individually possess. On the positive side, education for those young citizens consisted of facing the more obvious problems of the national group—such as eliminating illiteracy, reducing the power of a racial minority group, conserving wild life, or picking up scrap metals. Along with this active participation in solving national problems went a study of the national goals. Elementary education had become for all the children in those totalitarian nations a dramatic experience in doing socially useful tasks with a dual purpose of getting important work done and of developing the deeply rooted loyalty to a cause that follows a sacrifice willingly made.

Most laymen or educators acknowledge that the educational systems of those totalitarian nations have worked exceedingly well to accomplish their desired ends, and with the turn of events in world affairs, the democracies have critically re-examined the education of their future citizens. The question is raised on every hand—should education in a democracy be revamped? Much more was heard in 1940 than ever before of an elementary education that would develop appreciation of, and loyalty to, democratic institutions and ways of living.

An education to accomplish such objectives goes beyond the four walls of the traditional classroom. Hence children are being taken out to observe the manifold accomplishments of men and organizations in their local communities. Pupils are participating in celebrations commemorating events of the living as well as

CLASSROOM in the Crow Island school, Winnetka, Ill., completed in 1940. Designed by Eliel and Ero Saarinen, the building is a notably successful adaptation of modern architecture to the study requirements of elementary grades. Architects: Perkins, Wheeler and Will

names and dates of history. They are studying the great productive and marketing activities of modern society. To the extent that young children are mature enough to carry a part in community activities of a constructive nature, they are encouraged to work along with adults in beautification projects, in the improvement of the facilities for, and the use of, recreational opportunities, in the increase of health safeguards and health practices, etc. The trend is away from an exclusive reliance on verbal catechism of democracy and toward an active participation in, and support of, the numerous activities carried forward in a democratic community. In instructional materials the trend is clearly toward a democratic citizenship. Many new readers have been issued for use in the elementary grades that are built around the problems and promises of the democratic way of life. Social studies textbooks, arithmetic problems, composition manuals, anthologies of stories and poetry and almost every school text include an increased amount of material on the history, philosophy and current accomplishments of the nation. Teachers' guides and teaching suggestions stress citizenship more than ever before.

In the United States the effect of the war was not so far reaching nor dramatic. Noticeable was the threat of mounting national debt and higher taxation which resulted in halting advances in teachers' compensation, in keeping instructional supply budgets low and in retarding general improvement of the educational program. The one exception possibly was the physical plants, which were materially improved during 1940 through relief work projects of the WPA. One important factor in elementary education in the United States was the obvious decline in birth rate with the consequent decrease in enrolment in the lower grades.

The year 1940 was marked with heated controversy over the relative effect of inheritance and environment on the development of intelligence and personality. Most conferences on the issue concluded that the personality is the result of an interaction between these two factors rather than dependent on one or the other.

A careful study was made during 1940 of the place of such skills as reading, writing and figuring in the newer elementary curriculum. All educators seemed to agree that greater facility in the use of such skills was necessary. Experimental work was undertaken on the methods of mastering such skills in the projection of larger units of work. (P. R. H.)

Great Britain.—A year of war was a year of disturbanc of new problems for the elementary school. The evacuati children to more sparsely inhabited districts, their gradual r to the cities where schools were being used for other pur and the hurried provision of shelters so that the schools be restored to their proper use caused serious disorganizati the teaching and medical services and of school attendance tensive bombing in certain districts necessitated a second ev tion, as well as the preparation of fresh arrangements in other areas.

Much discussion took place on the question of compulso voluntary evacuation, and the difficulties received much mor tention than the benefits. Yet where careful inquiry had made, as in the Cambridge survey and the Liverpool survey results were reassuring and showed a measure of success far ferent from the impression given by less careful reports.

Out of the new conditions was emerging a wider conceptio elementary education and its place in the national life. Inge improvisations, experiments in home teaching, the adaptatio curricula to new environments, the establishment of camp sc in the country, extended arrangements for communal fee and the participation of school children in such national m ments as the war savings campaign, the collection of salvage the growing of more food were finding an echo in the discus about education that were springing up in all kinds of plac

Teachers and pupils alike showed a spirit of endeavour. war savings movement was in operation in over 90% of schools and it is recorded that one girls' school which previo collected less than £2 a week raised its weekly savings to £250. Many school gardens showed similar striking increas productivity and thousands of pupils assisted the war effo other ways.

The close connection between health and education was trated once more by figures published by the London co council. In the last 30 years the average height of boys incre by 2·2in., of girls by 2·1in.; in weight the increases were 7 and 8·1lb. The greatest increase was in the age group 1 years, a proof of the physical importance of the extension of school-leaving age. The death of H. A. L. Fisher who, towards end of the war of 1914–18, raised the question of national ed tion to fresh significance, was a reminder that events would s demand a new educational statesman able to adapt institution the rapidly changing forces of modern life.

BIBLIOGRAPHY.—W. P. Alexander, *The Educational Needs for mocracy;* F. Clarke, *Education and Social Change;* Leybourne and W *Education and the Birth-rate;* Padley and Cole (editors), *Evacuation vey.* (FR. S

Education, Progressive. Progressive education markedly influenced the educational theory and practice toward broadening the con of the role of the school from one of primarily training chil in the three R's to one of considering the whole developmen the child as an individual and as a member of society. This cept lays increased emphasis on the fine arts and other fo of self-expression, on mental hygiene and family relationsh and on a study of our changing civilization and the part e member of a democratic society must play in guiding that cha While the spirit and ideas of progressive education have affe schools generally, the organized movement is represented by Progressive Education association (president, Carleton Wa burne; executive director, Frederick L. Redefer).

This association, which is the United States section of the Education fellowship, had a membership in Sept. 1940 of 10, During the year 1940 it held a national conference in Chica Ill., attended by 4,000 persons, and 29 regional conferences

tudy groups and 10 "workshops" in various parts of the United tates and Canada. The association has fostered scientific research and the preparation of curricular materials through its arious national commissions and committees.

These include committees on child development and elementary ducation; all-youth; mental hygiene; conservation of human resources; museum-school relations; radio education; camping; international relations; and service and members; liaison officers in ducational freedom and in co-operatives and economic citizenhip; a joint commission with the N.E.A. on problems and use of uman and material resources; and standing committees on polies and plans, publications, finance and editorial policies for the ssociation's two monthly magazines, *Progressive Education* and *rontiers of Democracy.*

During 1940 three committees and several commissions brought eir work close to completion. The committee on workshops, fter five years of pioneer work, reflected in colleges and uniersities throughout the United States, was transferred in toto the commission on teacher education of the American Council n Education; the committee on the philosophy of progressive ducation made its final report in a scholarly manuscript; the ommittee on evaluating the results of progressive practices comleted its report with a document summarizing the results of all cientific comparisons of progressive and traditional methods.

The commissions on secondary school curriculum and the study f adolescence published several volumes giving the results of eir work since 1933. The commission on the relation of secndary schools and colleges completed its eight-year study and egan work on the publication of five volumes on its results.

The following books were published by the association during 940: *Language in General Education; Reader's Guide to Prose iction; Visual Arts in General Education; Mathematics in Genral Education; Emotion and Conduct in Adolescence; Social tudies in General Education; Physical Education in the Secondry School; The Personal-Social Development of Boys and Girls; ibliography on Secondary Education; Professional Education for xperienced Teachers.*

BIBLIOGRAPHY.—Boyd H. Bode, *Progressive Education at the Crossads;* John Dewey, *Experience and Education;* W. Carson Ryan, *Mental ealth through Education;* Carleton Washburne, *A Living Philosophy of ducation.* (C. WAS.)

ducation, Secondary.

The rigours of censorship make it difficult to secure accurate information of what was happening in 1940 to secondary education n the occupied territories of Europe. Reports which came hrough seem to indicate that educational institutions were being eorganized with characteristic thoroughness to coincide with the azi concept of educational purposes and the appropriate role for itizens of a subject state. Poland appeared to have suffered most everely; its universities and lycées were suppressed and their aculties largely confined in concentration camps. In France a horough-going reorganization of secondary education in line with otalitarian philosophy was instituted under the direction of the inister of education of the Vichy government.

United States.—Developments for 1940 in the United States, n the main, continued already discernible trends. Attacks on roblems of curriculum by state and regional organizations coninued, with selected secondary schools in California, Michigan, Ohio and the Southern Association of Colleges and Secondary Schools given freedom and encouragement to experiment with reised curriculums. Increased attention was given to the use f radio and motion pictures in the school and to planned excurions. Closer co-operation of the school with its community was tressed, both in interpretation of the educational program and n definite participation of the school in community improvement. There was a growing awareness of the responsibility of the secondary school toward all youth, illustrated in the effort to hold in school pupils who would ordinarily drop out, and in conscious co-operation with other agencies ministering to the needs of youth —the NYA, the CCC and the rapidly expanding adult education movement. A special phase of this responsibility was recognized in the organization of guidance for pupils of secondary school age. A broadened concept of guidance involved conscious participation of a larger proportion of the teaching personnel.

Schools undertook increased responsibilities in co-operation with the defence effort, both in expanding opportunities which types of technical training called for in the armament industries, and in heightened emphasis on education for democratic understanding and civic responsibility. Notable publications of 1940 which have implications for secondary education included studies of the status of rural and of Negro youth and of employment opportunities by the American Youth commission and an analysis of specially promising programs of civic education in secondary schools by the Educational Policies commission.

Latin America.—Significant developments were found in Latin America. With the exception of Argentina, where the secondary school antedated the university and developed along more democratic and liberal lines than elsewhere, secondary education in the South American countries was patterned largely along European lines with classical emphasis. Current proposals for reorganization were in the direction of a more liberal curriculum.

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Great Britain.—It seemed a far cry to those spacious days before the war when educationalists worried about the decline in the school population, the future of the public schools, staggered holidays and examination reforms. In the closing months of 1940 educationalists had to concentrate on the daily round, the common task—to keep the schools alive and as efficient as wartime difficulties permitted. The first phase appeared to be over. In this a large part of the secondary school system was disrupted by evacuation, commandeering of school buildings and closure in certain areas. Improvisation took place on a large scale. Classes were taken in all sorts of odd buildings and time-tables were strangely different from the past. Outdoor activities, gardening, domestic duties in some places partly ousted the standard subjects of the curriculum. Some schools shared buildings, some worked half time and some had to be content with various forms of directed home studies. In evacuation areas, where the state schools were closed, private schools and commercial colleges emerged and plied for hire. As time passed on and air raids did not develop to any extent, normality was partly restored. Schools were opened and the bulk of the children returned from the reception areas. By the summer of 1940, with the release of commandeered schools and the construction of air-raid shelters, the majority of the pupils had resumed a reasonable though restricted form of secondary education, though there were still many instances of schools being run in parts—one at home and the other in an evacuation centre.

The second phase was now upon the country. Staffing difficulties were growing, owing to the raising of the reserved age and the transfer of science masters to war work. It might be that the teaching of science would be radically affected, especially in evacuation schools which often lacked full facilities for practical work. Many of the schools were kept open during the summer holidays—a strange contrast with the policy of dispersal

and evacuation—and there was a danger of staleness creeping over staff and pupils. In addition there was the nervous excitement due to air-raid precautions and war tension. Many schools in the heavily raided areas were faced anew with evacuation and removal. Some of these were in serious difficulty due to a fall in numbers and were seeking amalgamation with other schools in safer areas.

All schools were faced with the problem of the shortened school life. The proportion of leavers was higher, not only due to economic pressure but also because of the competition for boys to replace men called up for war service. In addition some universities lowered their entrance standards, thus providing an extra incentive to the secondary school pupil to get started early on his university career before military service claimed him. This was bound to have a serious effect on sixth form work and also on the quality of the university entrant.

Briefly the tendencies seemed to be: (1) a falling off in sixth form work; (2) a lower leaving age and a fall in numbers; (3) a restriction and unbalancing of the curriculum due to staffing problems; (4) a growth of realistic and utility subjects at the expense of the traditional cultural subjects; and (5) a transfer of pupils from some boarding schools to the local grammar school. (T. TH.)

Education, Vocational. In the United States during the year 1940 vocational education focused its efforts primarily on problems of training for national defence. During 1939 vocational schools in certain areas began to train mechanics for aircraft plants on a limited scale. In June 1940 congress appropriated substantial funds for the training of mechanics for all defence industries, and the vocational schools of the nation undertook the great task of organizing those training programs. Taking advantage of the summer vacation period when regular vocational classes were not in session, extensive training programs were started in the several states. Within the first month 80,000 persons were enrolled in day, evening and all-night classes, which included upgrading courses for employed mechanics and pre-employment "refresher" courses for persons who had had some previous experience but needed short periods of training to qualify them for employment in defence industries.

In the early fall additional federal appropriations were made for continuing the program started during the summer, and federal funds were also provided for equipment for industrial schools, for the training of NYA workers in the public vocational schools, for the preparation of rural youth for defence industries and for the establishment of short intensive technical courses in the engineering colleges. As the vocational schools were fully occupied during the daytime by the regular day school students, the defence classes were scheduled for the late afternoon and the evening, with many schools operating all-night shifts following the close of the evening session. Primary attention was given to the machine tool and aircraft industries, although many courses were offered in shipbuilding, automotive repair, electrical maintenance, building construction and other fields. Many secondary schools which previously had offered no vocational training started defence classes, and many new schools designed primarily for defence training were being planned at the close of 1940.

Although national defence occupied the centre of attention during the year, vocational education programs in other fields continued to expand, in numbers of schools and in enrolments. Increased attention appears to have been given to closer correlation between various types of vocational programs, such as those of business and industry. In the field of agricultural education much was done in the evaluation of programs, in farm surveys to get at the needs of farm youth and in other aspects of research. Training for the distributive occupations increased greatly, a many new courses were offered in the training of persons for pu lic service occupations. Numerous programs of training for div sified occupations were developed or expanded. In the field homemaking, preparation for family life received continued e phasis, but considerable attention was also given to the prepa tion of girls for occupational life outside the home, in su fields as public foods service.

The trend toward higher age and grade levels of pupils in o vocational schools seemed to be continuing, with increased int est in vocational work on the junior college or technical ins tute level. State and local programs of occupational informat and vocational guidance continued to grow in extent and impo tance. Federal appropriation for vocational training for NYA pr ect workers through classes in the public vocational scho served to bring closer together the functions of the NYA and public schools toward the end of a more unified program for o of-school youth. (L. A. E.)

Great Britain.—Many technical colleges were engaged in p viding parts for war industries, but care was taken everywh strictly to subordinate the productive effort to the trainin the scope of which was not narrowed. The recommendations the Spens report were put into operation at the Belfast College Technology. The day schools have been styled the technical hi school and they provide a good general education in literary su jects, together with educational courses in science, art, comme and technical training.

The national council on commercial education discussed po war policy at its conference and was to make a careful inves gation of conditions before recommending action. The board education acknowledged that satisfactory accommodation was o of the most pressing educational needs, since in the absence fully adequate accommodation and equipment the schools co not make the contributions that they should to national efficien in industry and commerce. It was recognized that the reconstru tion of the trade of the nation after the war would intens the demand for proper equipment and training. The European w has not swept away the excellent facilities for education provid by many business houses, and new business training schol ships were established by the Dunlop Rubber company.

The police laboratories at Birmingham, Cardiff, Nottingh and Preston contributed substantially to the efficiency of t service, and a similar centre was proposed for Wakefield.

British Dominions.—A. Abbott again urged the government expand and strengthen the system of technical and commerc training in India. Some 4,000 technicians were required as first step, and much still remained to be done if the immen natural resources of India were to be fully utilized for the bene of her increasing population. (T. BE.)

Education Association, National: *see* NATIONAL EDU TION ASSOCIATION.

Eggs. Oct. 1940 production of eggs in the U.S. broke all pre ous records for that month, 2,215,000,000 eggs, wh was 8% higher than October production in 1939 and 18% abo the ten-year (1929–38) average for that month. The number laying hens on U.S. farms in Oct. 1940 was 279,074,000, prac cally the same as a year earlier, but the laying rate per hen in O 1940 was higher than ever before for that month, 794 eggs per hens compared to 736 for the same period in 1939 and 670 for ten-year average in October. The laying rate for the heaviest p duction month, April, was 1,652 eggs per 100 layers in 1940 a 1,699 in 1939, the ten-year average being 1,664. Laying hens U.S. farms at the end of 1940 were placed (preliminary estim

by the department of agriculture) at 5% under the number at the close of 1939, when there were 326,000,000 layers. Fewer pullets were kept for replacement in 1940. On Nov. 1 the number of pullets in farm flocks and not yet of laying age was estimated at 7% lower than in 1939. Egg production in 1940 was practically at the same level as in 1939. Although production the first ten months of 1940 showed a slight increase, 34,843,000,000 eggs compared to 34,168,000,000 in the first ten months of 1939, the slightly smaller laying flocks in November and December evened up the comparative figures. Total production for the 12 months of 1939 was 38,225,000,000 eggs. The ten-year average was 36,341,000,000. Eggs accumulate in cold storage during the months of heaviest production to a peak in August, when production begins to decline more rapidly and storage eggs move into consumption. Holdings of cold storage eggs Aug. 1, 1940, were 7,784,000 cases of shell eggs (30 doz. to the case) and 4,427,000 case equivalent of frozen eggs, compared to 7,024,000 cases of shell eggs and 4,125,000 case equivalent of frozen eggs Aug. 1, 1939. The Aug. 1940 holdings included 1,067,522 cases of shell eggs owned by the Federal Surplus Marketing administration for relief distribution. The Surplus Marketing administration's predecessor, the Federal Surplus Commodities corporation, held no storage eggs a year earlier. The government made in 1940 for relief distribution its heaviest purchases of eggs of any year, buying in all approximately 70,000,000 doz. at prices ranging from 5½ to 19 cents. During spring and summer, market prices paid producers ruled around 16-cent levels, about the same as in 1939. Owing to increased industrial activity and expanded consumer buying power, market prices more than doubled from August to December. Egg futures on the Chicago Mercantile exchange registered in November a two-year high. (*See* POULTRY.)

(S. O. R.)

Egypt. An independent kingdom of northeast Africa; bounded N. by the Mediterranean, S. by the Anglo-Egyptian Sudan, N.E. by Palestine, E. by the Red sea, W. by Libya and the Sahara. Area *c.* 383,000 sq.mi. (arable land 13,600 sq.mi.); pop. (census, 1937) 15,904,525. Chief towns (pop. 1937): Cairo (cap., 1,307,422); Alexandria (682,101); Port Said (126,907); Tanta (94,421); Mansura (68,637); Damanhur (61,791); Asyut (59,925). Ruler, King Farouk I; premier, Hussein Sirry Pasha (Nov. 14, 1940); language, Arabic; religion, Mohammedan 91%; Copt 7%.

History.—Although Egypt did not escape the impact of the war, the year 1940 was, relatively speaking, a tranquil one.

From the military point of view there was the occupation of Egyptian territory by the Italians, who, advancing across the Libyan frontier, occupied Sollum on Sept. 13 and Sidi Barrani on Sept. 16. Also Alexandria suffered several air raids, the first being on June 22. Suez and Port Said also each had a raid, but in no case was any serious damage done and the casualties were always small. Beyond this the war had no other direct effect on the country though its repercussion was felt in the political arena.

Aly Maher Pasha, who had assumed office on Aug. 18, 1939, was compelled to tender his resignation on June 22 owing to the difficulties which had arisen in connection with the interpretation of the Anglo-Egyptian treaty of alliance. He was succeeded on June 28 by Hassan Sabry Pasha. Himself an Independent, Sabry Pasha managed to persuade the Liberal-Constitutionals to accept seats in the new cabinet, which, comprising also the Saadists and Ittihadists and leading Independents, was more representative of the country than its predecessor.

Following Hassan Sabry Pasha's accession to power, Sir Ahmed Hassanein Pasha, the well-known explorer and first chamberlain to the king, became the king's political adviser as head of the royal cabinet on July 27.

As soon as the various controversial questions left outstanding had been liquidated, Sabry Pasha considered that the time had come to broaden the basis of his cabinet by including some of the followers of Nahas Pasha, the leader of the Wafd. His efforts were, however, in vain. He reconstructed his cabinet on Sept. 2 to enable himself to hold the portfolio of the interior in addition to foreign affairs.

On the declaration of war by Italy, Egypt broke off her relations with that country (June 12). The government took no further action beyond accelerating the reorganization and increase of the army and the passive defence system. Parliament decided, under the Aly Maher cabinet (June 12), confirmed soon after Sabry Pasha succeeded him (Aug. 21), that, while respecting the terms of the Anglo-Egyptian alliance and doing everything within her territory to furnish her ally with all aid necessary, Egypt would only participate in the war if she were attacked. With the Italian advance into Egypt, Dr. Ahmed Maher Pasha, the Saadist leader, and his colleagues were of the opinion that the conditions laid down by parliament had arisen, and on the majority of the cabinet deciding against any declaration of war on Italy, resigned. On Nov. 14 the premier died suddenly and his office was assumed by Hussein Sirry Pasha, the minister of works and an Independent, who took an early opportunity of confirming his predecessor's foreign policy and of pledging his government's continued support of the Anglo-Egyptian treaty. The question of entry into the war was obviated by the British advance on Dec. 9 which succeeded in practically driving the Italians out of Egypt within a week.

The economic situation was satisfactory. Two important factors conduced to this. The presence of continually-increasing British forces in the country brought into circulation a considerable amount of money which benefited all classes of the community. The British government's undertaking to purchase the

"BIG BRAVE BENITO" thought he had the lion whipped in Africa until Dec. 1940, but Shoemaker of the *Chicago Daily News* didn't give him much credit

ITALIAN COLONIAL TROOPS advancing on El Sollum, Egypt, shortly after launching the long-delayed Egyptian campaign Sept. 12, 1940. Thousands of these troops were captured in the British counteroffensive which began Dec. 9

Egyptian cotton crop resulted in an easing off of the agricultural position since the decision was taken at a time when the bulk of the crop was still in the hands of the growers.

Three important financial decisions were taken during 1940, the extension of the charter of the National bank together with the monopoly of the note issue for another 40 years as from Aug. 12, the transformation of that bank into a Central bank on the same date, and parliament's approval of the liquidation of the Public Debt commission (July 17).

The suppression of this international body had been accepted by England and France, but still needed the acceptance of Italy. When the latter became a belligerent, however, the liquidation was carried out without its assent.

In February, Aly Maher Pasha, the first prime minister to set foot on Sudanese soil since the reconquest, paid a visit to Khartoum on the invitation of the governor-general, Sir Stewart Symes.

A second daughter (Princess Fawzieh) was born to King Farouk and Queen Farida on April 7. (A. Mn.)

Education, 1936–37.—Elementary and secondary: government schools 4,795; scholars 930,248; high schools: government 6; scholars 1,123; Fuad I university: scholars 8,150; foreign schools 410; scholars 76,750.

Banking and Finance.—Revenue (est. 1939–40) £E.40,247,000; expenditure (est. 1939–40) £E.41,847,000; public debt (May 1, 1939) £E.94,614,360; reserve from budget surpluses £E.33,062,569; notes in circulation (Aug. 31, 1939) £E.22,200,000; gold reserve £E.6,500,000; net profit of the National bank (1938) £E.474,640, (1939) £E.379,651; exchange rate (£E.1 = 100 piastres): 97½ piastres = £1 sterling.

Trade and Communication.—External trade (merchandise): imports (1938) £E.36,934,373, (1939) £E.34,091,000; exports (1938) £E.29,342,486, (1939) £E.34,081,000; re-exports (1938) £E.782,528. Communications and transport, 1938: roads, main 1,240 mi.; secondary 3,430 mi.; railways, state 3,537 mi.; agricultural 876 mi.; shipping 60,495 tons gross; entered ports 35,390,325 tons gross; passed through Suez canal 25,827,977 tons gross; motor vehicles licensed (Dec. 31, 1938): cars 29,382; commercial 4,074; cycles 2,051; wireless receiving set licences (Dec. 31, 1938) 78,823; telephone instruments in use (April 30, 1938) 59,922.

Aerial Navigation (1938)

	Misr Airways Company	Imperial Airways Ltd.	"K.L.M." Royal Dutch Air Lines
Passengers	18,559	6,056	2,459
Freight and baggage (Kg.)	63,828	114,189	45,140
Mails (Kg.)	16,435	1,482,130	131,851
Miles flown	1,011,104	6,967,935	2,795,180
Regularity of service	98.1%	99.9%	98.2%

Agriculture and Minerals.—Production 1938 (in metric tons) cotton, ginned 494,500; maize 1,570,700; wheat 1,250,200, (193 1,333,800; rice 725,200; petroleum 225,700; phosphate rock 45 400; cane sugar, refined 209,000; barley 232,700, (1939) 238,2 ground-nuts 15,600.

Eire. Eire is the southern portion of an island to the west Great Britain, extending from 51°26′ to 51°21′ N., a from 5°25′ to 10°30′ W. Under the constitution, operative sin Dec. 29, 1937, the name "Irish Free State," given by the trea of 1921 to the 26 counties and four of the county boroughs southern Ireland, was replaced by that of "Eire," or Irelan President: Dr. Douglas Hyde (*de h-Ide*). National flag: the t colour of green, white and orange.

Area and Population.—Area 26,601 sq.mi.; pop. (est. Ju 30, 1939) 2,934,000. Chief towns (pop. census 1936): Dub (cap., est. 1939, 482,300); Cork (80,765); Limerick (41,06 Dun Laoghaire (est. 1939, 40,600); Waterford (27,968). La guages: Irish and English; religion: Christian (Roman Catho 93%).

History.—By Jan. 3, 1940 the government had recovered abo 900,000 out of 1,084,000 rounds of ammunition taken at Chri mas from the Dublin magazine fort, and most of the remaino was later recovered.

As a result of a high court decision declaring unconstitutio the Offences Against the State Act, 1939, amending legislati was rushed through the Oireachtas on Jan. 3, and submitted the president, on the advice of the council of state, to the preme court which on Feb. 9 pronounced it not repugnant to constitution.

On Feb. 24 ten prisoners held under the new law went hunger-strike. One of them died on the 17th day of the stri another on the 19th, whereupon the strike collapsed. On Ap 24 an attempt was made to blow up Dublin castle, and on Ma two detectives guarding mails were attacked and sever wounded. The Emergency Powers act was further amended June 26 so as to give military courts jurisdiction over civilia Under this legislation two men were tried for the murder o detective in an affray on Aug. 16, and, after vain appeals to ordinary courts, executed on Sept. 6.

The war has led to the practical cessation of party politi By-elections have been postponed by consent, and on May after the army had been put on a war footing, a National Defe council was formed representing the three main parties. On Ju 16, at a great recruiting rally in Dublin, Messrs. de Valera a Cosgrave appeared on one platform for the first time since 19 Meanwhile de Valera, while on May 11 he protested against invasion of Holland and Belgium, made it clear in an intervi on July 5 that Eire intended to remain neutral, and rejected schemes for all-Ireland defence except on a basis of unity a neutrality.

Most important defensive measures have been the expansion the army, the rapid enrolment of a local defence force, now nu bering over 100,000, the establishment of emergency parish co mittees and the appointment of regional commissioners to ta care of supplies. (M. T.)

Education.—In 1937–38: elementary schools, 5,166; schol 469,925; secondary schools 336; scholars 36,092; universiti National 4,422 students; Trinity college, Dublin 1,489. (*See a* Education: *British Empire.*)

Banking and Finance.—Revenue, ordinary (1939–40) £3 454,000; (est. 1940–41) £33,718,000; expenditure, ordina (1939–40) £34,395,023; (est. 1940–41) £35,584,000; public d (March 31, 1940) £50,918,000; notes in circulation (Aug. 1939) £16,058,921; gold bullion (March 31, 1939) £1,991,68

eserve, British bank securities (March 31, 1939) £8,173,000.

Trade and Communication.—Foreign trade (merchandise): nports (1939) £43,497,434; exports and re-exports (1939) 26,902,013. Communications: roads, main (1937–38) 10,000 ni.; secondary 38,000mi.; railways, total track mileage (1938) ,551mi.; shipping (1938): vessels 594; net tonnage 116,145; notor vehicles licensed (Aug. 1938): private cars 48,599; other ehicles 20,997; wireless receiving set licences (1937–38) 140,-87; telephones, installations (1937–38) 26,190.

Agriculture, Manufactures, Mineral Production.—Production 1938 (in metric tons): oats 559,000; wheat 198,170; potaoes 2,460,870; barley 110,180; beet sugar 416,460; coal (1937) 20,000; wool (1937) 8,100. Agriculture and fisheries, net output 1937) £42,000,000; industry, net output (1937) £39,800,000.

Labour 1937–38.—Number of insured workers, average 433,-65; number of unemployed, average 88,714.

Industrial Production Census in Eire (preliminary figures) 1938

Industry or Trade	Gross output £	Net output £	Persons employed
Boots and shoes	1,743,206	825,984	6,508
Brewing	7,883,959	6,629,090	3,830
Sugar and confectionery	3,431,244	1,102,175	4,741
Bacon curing	6,652,123	850,350	2,381
Shirt making	417,207	185,138	2,097
Hosiery	1,101,211	559,445	4,887
Textiles	2,201,237	804,348	5,937
Tobacco	6,962,345	1,382,409	2,399
Vehicles	3,046,639	892,002	3,595

isen, Gustavus Augustus (1847–1940), Swedish-American archaeologist and nthropologist, was born in Stockholm, Sweden, Aug. 2. Graduted from the University of Uppsala in 1873, he went to the nited States in October of that year and later worked with the nited States department of agriculture. He agitated successfully or the preservation of the sequoia trees in California and enaged in anthropological explorations in Spain, Italy, Algeria, unis, Morocco and Egypt. He devoted some time to the study the Chalice of Antioch and the possibility that it was the Holy rail.

He was the author of more than 100 books and papers dealing ith antiquarian and anthropological subjects. He died in New ork city, Oct. 29.

lections. In the elections of 1940 the contest of pre-eminent interest was that for the presidency. Durg the early pre-convention manoeuvres the leading aspirants or Republican nomination were Thomas E. Dewey and Robert . Taft. Wendell L. Willkie, though entering the field later, ained quick recognition as a potential dark horse. When the epublican convention opened at Philadelphia on June 24, he ad few pledged delegates; but as his two chief rivals approached stalemate, his position improved; and on the sixth ballot he as nominated. Senator Charles L. McNary was then chosen as ndidate for the vice-presidency.

In the Democratic fold several names had been plausibly menoned, but only two—John Nance Garner and James A. Farley -openly admitted their candidacy. Others, more coy to the honr, would not put themselves forward while Roosevelt's intenons remained in doubt. And this doubt was not resolved until ly 16 when, after the Democratic convention had assembled at hicago, the president declared his willingness to stand for a ird term. After this declaration his nomination was mere roune. Some opposition arose, indeed, against his designated choice f Henry A. Wallace as a running mate; but this opposition was uickly overcome and Wallace received an adequate majority on e first ballot.

In the campaign that followed, discussion centred most prominently upon the war and its relation to the United States. Yet no fundamental differences were voiced by the two principal candidates upon this subject. Both favoured a vigorous defence program and all possible aid to Britain "short of war." Roosevelt had the advantage of position, which enabled him to counter verbal attacks with dramatic action—as when he announced that fifty over-age destroyers would be given to Britain in exchange for the lease of certain sites for naval bases. Willkie could hardly disapprove the substance of this transaction although he criticized the manner in which it was arranged.

On domestic issues there was almost as little avowed disagreement. Willkie declared himself in favour of retaining the main features of New Deal meliorative legislation, promising only that, if he were elected, he would give it more efficient and impartial execution.

The press lined up heavily on the Republican side, and a number of papers and individuals formerly prominent in the Democratic party went over to the opposition. A notable defection was that of the normally Democratic but always conservative *New York Times*. More remarkable, on the other hand, was the decision of the independent *St. Louis Post-Dispatch* to support Roosevelt after having opposed him in 1936 and having vigorously denounced his policies in 1940.

It is impossible to determine what considerations finally prevailed with the voters. No doubt a general disinclination to change leadership in the midst of a crisis had much weight. And apparently the long fostered tradition against a third term was less deeply seated than some Republicans had wishfully imagined. The various straw votes, particularly that conducted by George Gallup, tended to show a considerable fluctuation of opinion from week to week. One may, however, question whether this seeming inconstancy was really in the attitude of the electorate or merely in the samples taken since it usually kept well within the tolerance for error assumed by Dr. Gallup. But, whatever the facts may have been, the ultimate ballot ratios came very near to those forecast by some political analysts in 1939: 27,245,422 or 54·7% of the total popular vote and 449 electoral votes for Roosevelt to 22,333,801 or 44·8% of the popular vote and 82 electoral votes for Willkie. Among the minor tickets entered it may be observed that Norman Thomas, the Socialist candidate, received only 116,-796 popular votes; Earl Browder, the Communist candidate, only 48,789; Roger Babson, the Prohibitionist candidate, only 58,600; and all others only 15,274.

The general elections left the party balance almost unchanged. In the house of representatives the Democrats gained 6 seats, giving them 268 members to 162 Republicans, 3 Progressives, 1 Farmer Laborite, and 1 American Laborite. In the senate the

Electoral Vote by States, 1940 Election

State	Roosevelt	Willkie	State	Roosevelt	Willkie
Alabama	11	..	Nevada	3	..
Arizona	3	..	New Hampshire	4	..
Arkansas	9	..	New Jersey	16	..
California	22	..	New Mexico	3	..
Colorado	..	6	New York	47	..
Connecticut	8	..	North Carolina	13	..
Delaware	3	..	North Dakota	.	4
Florida	7	..	Ohio	26	..
Georgia	12	..	Oklahoma	11	..
Idaho	4	..	Oregon	5	..
Illinois	29	..	Pennsylvania	36	..
Indiana	..	14	Rhode Island	4	..
Iowa	..	11	South Carolina	8	..
Kansas	..	9	South Dakota	..	4
Kentucky	11	..	Tennessee	11	..
Louisiana	10	..	Texas	23	..
Maine	..	5	Utah	4	.
Maryland	8	..	Vermont	..	3
Massachusetts	17	..	Virginia	11	..
Michigan	..	19	Washington	8	..
Minnesota	11	..	West Virginia	8	.
Mississippi	9	.	Wisconsin	12	..
Missouri	15	.	Wyoming	3	..
Montana	4	.			
Nebraska	.	7	Totals	449	82

ICKES, HOPKINS, *ET AL.* saw to it that President Roosevelt's "curfew should not ring tonight," in this cartoon by Carlisle of the *Des Moines Register*. The third term was a favourite subject for U.S. cartoonists in 1940

Republicans gained 3 places (not counting 1 Farmer Labor member who was returned on the Republican ticket); but the Democrats retained their control with 66 members to 28 Republicans, 1 Progressive and 1 Independent. Of the 35 governorships at issue during 1940 the ratio remained substantially as before—18 Democrats to 17 Republicans (barring recounts) or a gain of 2 states for the Republicans.

Schedule of Elections.—Presidential elections in the United States are uniformly held on the Tuesday after the first Monday in November in years designated by multiples of four. Congressional elections are held on the same or corresponding day in even years by all states except Maine, which adheres to its old custom of holding elections on the second Monday in September. Governors are elected in even years on the same day as members of congress in 22 states: Arizona, Arkansas, Colorado, Connecticut, Georgia, Idaho, Iowa, Kansas, Massachusetts, Michigan, Minnesota, Nebraska, New Hampshire, New Mexico, North Dakota, Ohio, Rhode Island, South Dakota, Tennessee, Texas, Vermont and Wisconsin. They are elected quadrennially at the same time as the president in 10 states: Delaware, Florida, Illinois, Indiana, Missouri, Montana, North Carolina, Utah, Washington and West Virginia; quadrennially at the congressional elections between presidential years in 10 states: Alabama, California, Maryland, Nevada, New York, Oklahoma, Oregon, Pennsylvania, South Carolina and Wyoming; quadrennially on the corresponding day in the years immediately preceding presidential elections in 2 states: Kentucky and Mississippi; quadrennially on the corresponding day in the years immediately following presidential elections in 1 state: Virginia; triennially on the corresponding day in 1 state: New Jersey. Louisiana chooses its governor quadrennially in presidential years on the third Thursday in April; and Maine, biennially at the same time as she selects her congressmen. (*See* also DEMOCRATIC PARTY; ELECTORAL VOTE; REPUBLICAN PARTY; UNITED STATES and under various state articles.) For elections in other countries see under the name of the country. (G. P. BA.)

Electrical Industries. National defence preparations made 1940 a year of superlatives for the electrical industry. Never before had output of electricity grown so fast, or orders for electrical apparatus or purchases of generating equipment increased so greatly, as in the last six months of 1940.

The December peak week just missed reaching 3,000,00 000kw.-hr. output. The lowest week of the year (July, 4th we was larger than the largest week in 1929 by 20%. The result a record output for the year of 144,600,000,000kw.hr.

New generating capacity in the U.S. totalling 1,850,000kw. placed in service in 1940. Scheduled for delivery in 1941 4,000,000kw., and for future years nearly 3,500,000—a to stimulated primarily by defence of 9,500,000kw. The delive of new steam generating equipment in 1941 for utility use will the largest on record.

Of the new 1940 capacity, steam made up 70%, hydro 28% internal combustion 2%. In Canada, on the other hand, hy with 227,000kw. accounted for most of the gain.

The average hours' use of fuel capacity in 1940 exceeded 3, hr. for the first time, going to 3,251hr., thus reflecting the dou shift industrial operations.

Because of rearmament, industrial sales dominated the business. Nevertheless, there were 1,000,000,000 new residen customers. Average residential usage continued to grow and the end of the year stood at 952kw.hr., at an average rate be four cents for the first time.

Expenses were in line with increased revenue as shown by operating ratio which remained fairly steady at 37·5%. Ta on the other hand, took a jump that was twice that of any pre ous year. The increase of $65,000,000 brought the total uti tax bill up to $405,000,000, or approximately 18 cents out every dollar of revenue for taxes.

Close to $600,000,000 were spent for new capital additions plant in 1940 and $724,000,000 were budgeted for 1941. Gene ing capacity gets 42%, while transmission, distribution and s stations get 53% of the 1941 construction dollar.

In spite of the large capital expenditures in 1940, only $ 000,000 worth of new securities was floated.

Manufacturers' sales reflected the defence buying and, ex sive of appliances, amounted to $1,800,000,000, or just under peak year of 1929. Sales booked were the largest on rec resulting in a record backlog carried over to 1941. Electr exports increased 27%. Electric appliances had a big year. frigerators nearly equalled the previous peak. Ranges at 450, units were the best ever, as well as water heaters at 125, units.

In lighting, the big advance was in fluorescent. Sales expan faster than manufacturing capacity. Almost all production power-factor corrected. High general lighting values with fl escent, some up to 85 foot-candles, were recorded. An evalu helped to restimulate street lighting so that it is once more the up trend.

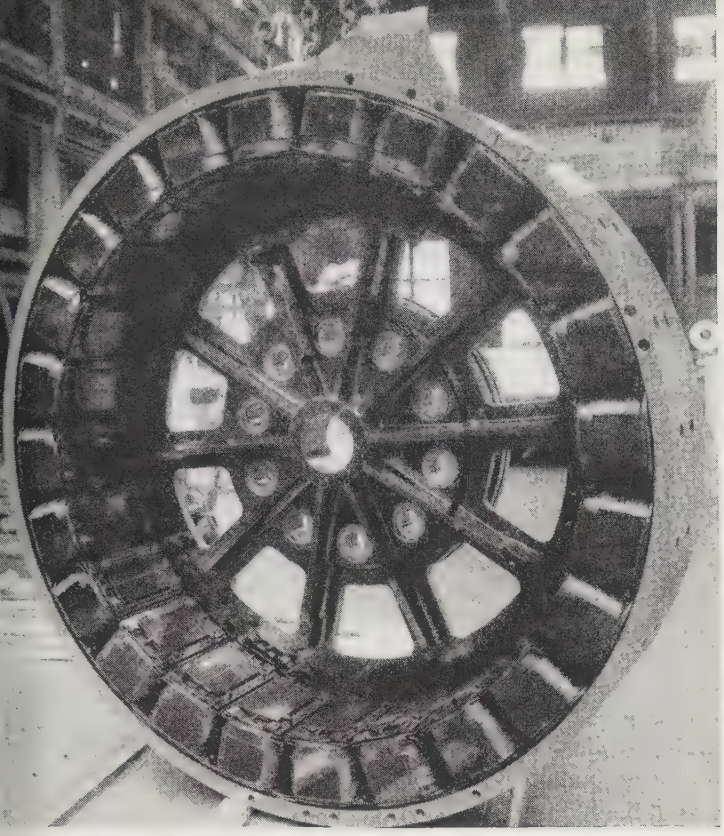
In engineering the trend toward improved service reliabi was continued in more reliance on wood insulation, advance grounding, differential protection, large air circuit breakers field apparatus testing.

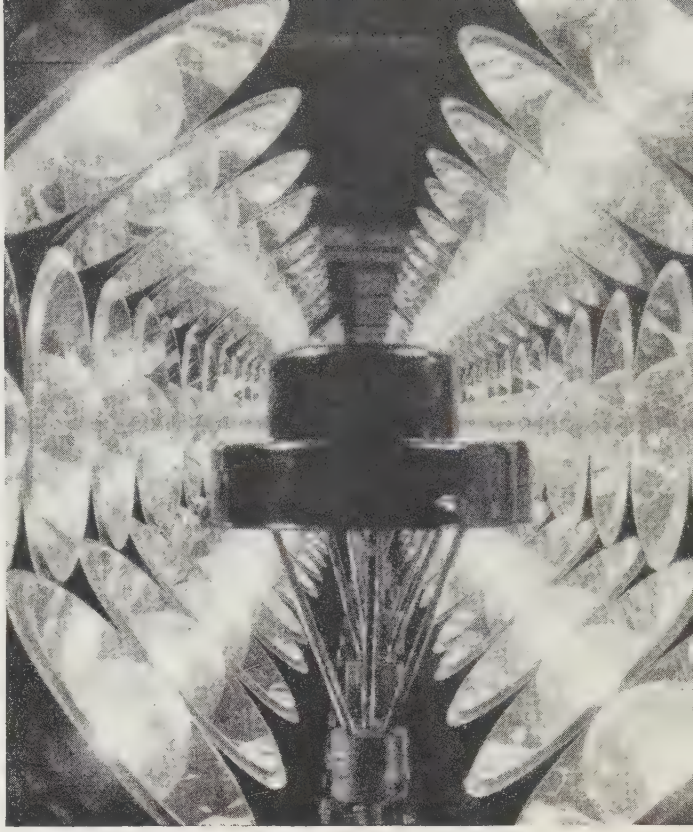
New generating capacity which for a few years had been larg super-positive turned 1940 back to condensing units. The forced circulation boiler for utility plants in the U.S.A. ordered.

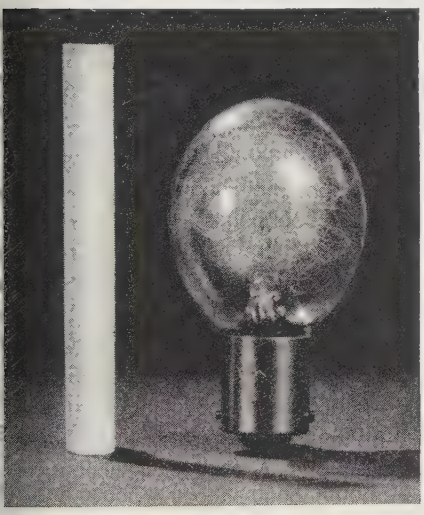
A trend toward economy in distribution practice was very dent with self-supporting residential cables, large orders capacitors and regulators.

Rate reductions aggregated approximately half the amount 1940.

Public ownership continued to expand in 1940, but almost tirely in territory where there was a federal project. Out such areas the population going to municipal ownership tota but 27,000.







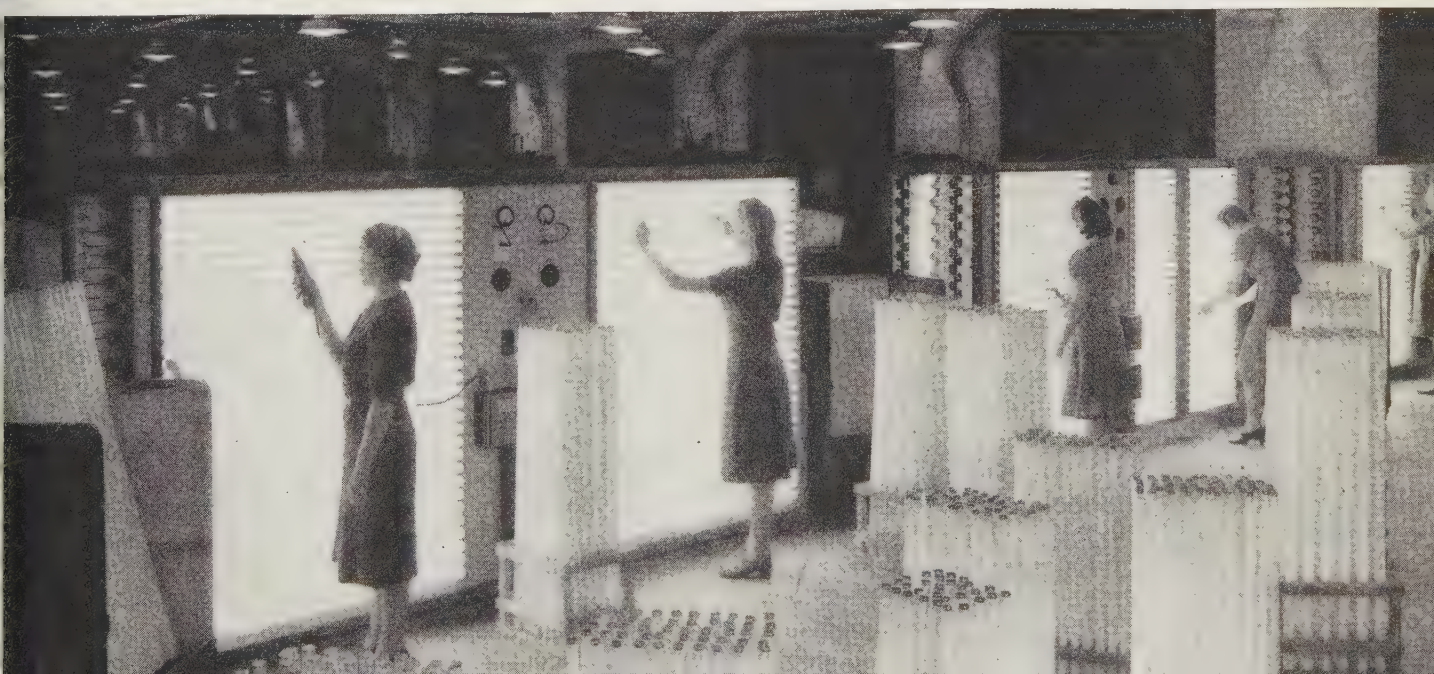
Above, left: ELECTRIC COUPLING which transmits diesel power to a ship's screws without conveying the engine's vibrations. This coupling, which operates as a motor, was first tested on a cargo vessel Feb. 9, 1940

Above, right: BATTERY OF DRYING LAMPS producing infrared (heat) waves, designed in 1940 to hasten the drying of paint

Left: THE WORLD'S SMALLEST practical photoflash lamp as it compares in size with a cigarette. Eighty per cent of flash photographs can be taken with this tiny point-source of light

Right: POPPING CORN over a 1,000-watt drying lamp introduced in 1940

Below: TESTING RACKS of fluorescent lamps. Production of this new type of lighting increased greatly in 1940



In Washington, Nebraska and Alabama considerable privately owned utility property was sold to public utility districts. The year 1941 was expected to show even larger inroads.

No new government projects were started in 1940, but an additional $65,000,000 were granted TVA under the plea of defence requirements. St. Lawrence came up again, this time purely as a power project. Canada voiced its willingness to go along. It will be put up to congress in 1941. Power improvements in the White river in Arkansas and Savannah river in Georgia were proposed.

Several important precedents were set by the courts, the most important of which was the supreme court decision in the New River case, giving jurisdiction to the federal government over virtually every stream by defining "navigability" as possibility of being made navigable.

Utilities were given the legal right to severance values where a public body wanted to buy part of a property; rural telephone companies were denied the right to enjoin rural co-ops from inductive interference; municipalities were denied damages because power companies tried to enjoin PWA operations; a state was denied the right to file an injunction against the construction of a federal hydro project.

A power grid was proposed to interconnect the eastern and middle west munitions areas. As 1940 closed, a report was expected. In the meantime several hundred miles of high tension interconnections were built and more were on the books for 1941.

All of the larger holding companies were cited to show cause why they should not comply with the integration provisions of the Holding Company act. Proceedings started. In several instances consolidation of intermediate holding companies with subsidiaries was voluntarily undertaken.

Some plans, but no action, for integration of large systems were announced.

Money was available for utility financing at a lower rate than ever before, several issues yielding less than 3% and one down to $2\frac{1}{2}$%. Two sizable common stock issues were sold—the first of any consequence since the crash of 1929.

Federal Power commission made it evident that it expected early compliance with the demand for historical costs. Subsidiary properties were denied new financing which did not provide for substantial stock sales to the public. Private sales of security issues were frowned on. Interlocking directors and officers of holding companies and service companies were ordered terminated.

Canada.—Canada also had a year of record demands for electricity. In spite of reductions in sales of secondary power for export and for use in electric boilers, a new record total of something in excess of 30,000,000,000 kw.hr. was generated.

Europe.—Data from Europe on power generation were not available. It was known, however, that due to black-outs, fuel and lighting restrictions and priorities the consumption of electric energy in Europe was below that for years prior to the European war.

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Electric Lighting.

Light Sources.—Upon the basis of 1938 figures taken as 100% the United States consumption of filament lamps increased in 1940 to 117%, the dollar value to 121% and the wattage to 131%. The increase in the United States of electric power consumption by some 9·4% over 1939 and nearing 2,800,000,000 kw.hr. per week was reflected in lighting consumption, it being estimated that some 35% more lumens were generated electrically in 1940 than in 1938.

The United States consumption was some 600,000,000 large

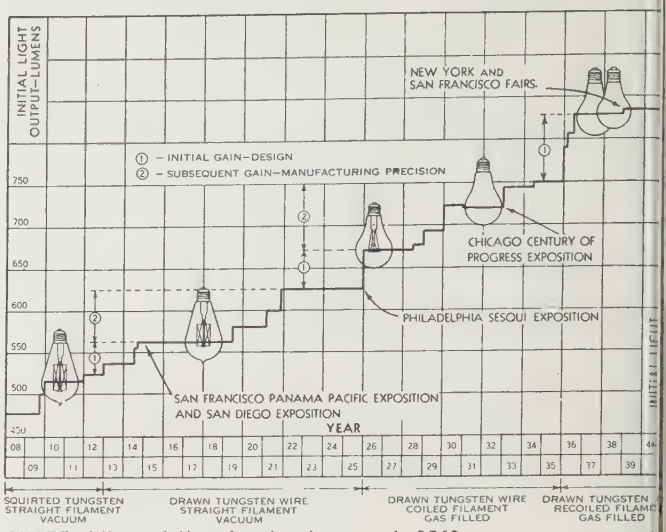

CHART of the evolution of modern lamps up to 1940

lamps, and 286,000,000 miniature lamps exclusive of Christmas tree types. Of the latter the consumption was 175,000,000 of which some 65,000,000 were imported. Production of Christmas tree lamps of the 6-volt design, 20 in series, was introduced to standardize this usage. Some 2,000,000 sealed beam automobile head lamps were installed, improving night motoring. North American practice centred on the 5-in. sealed head lamp and a new localized beam fog lamp. In the United States some 12,000,000 photoflash lamps were consumed in photography, the chief innovation being the midget $1\frac{3}{8}$-in. bulb rated at 1,200,000 lumens.

The fluorescent tubular lamps made some progress in western Europe but in North America expanded 400% over 1931. During 1940 the price was reduced 35%; the life lengthened to 2,500 hr. and the efficiency increased 41%, averaging 45 lumens per watt. The 100-watt 60-in. lamp, a 14-watt 15-in. lamp and a 6-watt 9-in. lamp were added. Extended usage developed with 250-watt R-40 bulb reflector-neck drying or infrared lamps in industrial processing, utilizing chiefly the 12,000 angstrom energy. Further progress in North America was made toward 120-volt lighting standardization, with the manufacture of many auxiliary devices centring at 118 volts. Prices of regular filament lamps decreased in the United States to 13 cents for wattages up to 60 inclusive and 15 cents for 75- and 100-watt sizes.

Greater interest developed in bactericidal or short wave ultraviolet, in killing pathogenic organisms chiefly in air and in preserving meat and other foods. Experimentally a continuous spectrum tellurium vapour lamp and a 10,000-watt water-cooled mercury vapour lamp were demonstrated—this, with the exception of the positive carbon arc crater, being the brightest man-made source. Postponement of any international lighting standardization or application principles and the holding in abeyance of the International Congress of Illumination halted many of the records of lighting development in the eastern hemisphere.

Lighting Applications. — Black-out precautions in European cities decreased, using masked street lighting units producing roadway intensities on the order of 1% of moonlight, coincidentally with the usage of screened mercury vapour lamps, in the range of 100 watts, emitting "black light" or 3,600 angstrom energy. With the latter were used many types of fluorescent and phosphorescent signs and danger markers. In the America increasing interest developed in fluorescent carpets, fabrics and printing in conjunction with "black light" for cinema and assembly halls. Industrial lighting in western Europe, chiefly with filament lamps, expanded rapidly but all other types of lighting suffered great shrinkage.

The second year of the New York and San Francisco world's fairs again emphasized decorative possibilities of exterior lighting with a higher percentage of fluorescent and mercury vapour lamps, usage of the latter expanding in the United States through the installation of some 1,100 of the 250-watt size in seven miles of tunnels on the Pennsylvania turnpike. The remarkable growth of fluorescent lamps in North America reached an estimated volume of 6,000,000 with the 48-in. 40-watt lamp the most

opular. The white fluorescent lamp of 3,500° K colour temperature supplanted the 1939 "white" of 2,800° K, and was followed in demand by he 6,500° K daylight colour, while a new orchid tint, "soft white," extended applications to food retailing and department stores. In residences n the United States the average connected lighting wattage exceeded 1,300 vith some 28 lamp sockets, 5.9 portables; or an average of 18 lighting xtures. Home lighting lamp bulbs averaged 52 watts; the I.E.S. type of ortable lamp averaged 120 watts. Night baseball was established by luminating typical parks each with 200,000,000 c.p., from some 800 oodlights and using 1,500-watt filament lamps. Lighting intensities with uorescent sources established new levels upward of 35 ft.-candles with a endency toward the operation of twin lamps on a single ballast reactor, educing flicker. (*See* also ELECTRICAL INDUSTRIES.) (S. G. H.)

Electric Transmission and Distribution.

The year 1940 was characterized by a considerable expansion in facilities, especially in power listribution systems. This is in marked contrast with the depression years when the continually increasing household-appliance oad was accommodated by decreased industrial load and by using very contrivable means, such as induction regulators, capacitors or power-factor correction and tap-changing transformers, to ncrease the power capacities of existing circuits. Although these economies continued to be utilized, the increased demand for ower made necessary the installation of new lines and equipment and in some cases extensive redesign of distribution systems. There has been an increasing tendency to put distribution ircuits underground, but the war experience in Europe seemed o indicate that underground circuits can be badly damaged by ombs and that the subsequent repair of aerial circuits can be arried out much more quickly and more easily. Outdoor unitype substations of various capacities and voltages were gaining n popularity and, in order to supply temporary loads or to care or new loads while permanent substations could be constructed, ortable substations mounted on automobile trailers were being sed.

Although there was very little legal pressure upon power companies to give attention to interference to radio reception on ccount of noises caused by distribution circuits, some companies vere considering it a matter of public courtesy to do what they ould within reason to decrease this interference. In some cases ew insulators especially treated to prevent "sizzling" and "frying" replaced the older ones and the sections of line thus immunized were isolated from the other sections by the use of eries inductive filters or shunt capacitive filters.

The high-tension transmission lines of the United States came nto being one by one as means of carrying power from distant ower sites to metropolitan or industrial centres. As the individual systems have grown and have approached each other, interconnections among the systems have been made until in 1940 he country was honeycombed with a network of high-tension ransmission lines. The defence program under way made it pertinent to ask whether this network is adequate in transmitting ability and whether it has the requisite invulnerability for warmergency conditions. Studies show that both of these requirenents have been satisfied over the thickly-settled portions of the ountry. Several additional tie lines were being constructed in 940 to strengthen further the dependability and flexibility of he network. The most notable of these was the 277-mi., 161-kv. ink under construction in 1940 to connect the well-integrated ystems of Washington, Oregon and Montana with those of Utah nd Idaho. The new line runs from Anaconda, Mont., to Grace, da. and was to be completed at the beginning of 1941.

Several high-tension lines were completed during the year. Among these was the 147-mi. line of the Commonwealth Edison ompany from its Powerton generating station to the Crawford tation in Chicago. Except for a short section near Chicago, this ine is of single-circuit three-phase construction with 900,000 circular-mil aluminium cable steel reinforced, protected by two copper-coated steel ground wires. At the Chicago end is a 75,000-kva. synchronous condenser, the largest ever built.

The longest of the lines completed during 1940 was the 234-mi., 230-kv. line from Bonneville to Grand Coulee in the Pacific northwest. Construction was begun in Aug. 1939 and the line was finished in almost exactly one year. Right of way for a second line to parallel this one has been purchased and this second line will be undertaken when power is available at Grand Coulee dam. A line 183mi. long from Grand Coulee to Puget sound has been authorized for immediate construction. A 41-mi. section of 230-kv. line from Vancouver to Kelso, Wash., and a 30-mi. section from Kelso to Chehalis have been completed and the third section, terminating at Tacoma and Seattle, will deliver Bonneville power to the Puget sound area early in 1941.

Operating experience with the single-circuit 230-kv. Boulder dam line of the Southern California Edison company is of special interest because of its inexpensive construction relative to the cost of a double-circuit line. It is 233 mi. in length, is protected by two zinc-coated steel ground wires and Petersen coils (ground-fault neutralizers) at both ends, and has counterpoises at all tower bases where the tower footing resistance exceeded 100 ohms. In about one and one-half years of service there has been only one interruption while the line has operated as a base-load source delivering 165,000 kw. at a load factor of 97%. During 1940 this line was extended from the Chino substation to the Barre substation, a distance of 26mi., where it ties in with the Big Creek system through existing 66-kv. lines which will be replaced by a 230-kv. tie line. (*See* also RURAL ELECTRIFICATION.)

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Electric Transportation.

In 1940 there were 20 cities throughout the world having either subway or elevated railway service. Those having subways were Barcelona, Berlin, Boston, Buenos Aires, Glasgow, London, Madrid, Moscow, New York, Osaka, Paris, Philadelphia, Sydney and Tokyo. Chicago had an extensive subway project under construction, and similar activities were reported from Munich and Prague. Cities having elevated railway systems included Chicago, Hamburg, Liverpool, New York and Philadelphia. Besides these there were services of a rapid transit character in a number of other places such as Cleveland and Vienna.

Elberfeld (Germany) had the distinction of having the world's only monorail elevated line.

According to the latest available figures there were about 7,000 trolley-bus vehicles in 1940 in a score of countries throughout the world. Great Britain and the United States were the leaders

Table I.—*Rapid Transit Systems of the World*
(As of Jan. 1, 1941)

Place	Miles of track	Cars	Place	Miles of track	Cars
Barcelona* .	37	92	Madrid . . .	12	144
Berlin . . .	276	2,372	Moscow. . .	33	128
Boston . . .	55	528	Munich . . .	Under co	nstruction
Buenos Aires*	22½	204	New York† .	1,006	8,408
Chicago . .	202½	1,640	Osaka . . .	1½	No data
Cleveland. .	29	34	Paris	110	2,781
Elberfeld . .	8	67	Philadelphia.	73½	540
Glasgow . .	13	50	Prague . . .	Under co	nstruction
Hamburg . .	50	328	Sydney . . .	2½	No data
Liverpool . .	13½	57	Tokyo . . .	10	20
London . .	492	3,629	Vienna . . .	87	483

*Total for three systems. †Total for five systems.

in this field, the former having some 2,600 such vehicles in operation and the latter approximately 3,000. Elsewhere there were about 1,300 additional trolley buses in operation.

Self-Contained Units.—In the 1920s an entirely new type of electric transportation vehicle was developed, called a "gas-electric" bus. In this design an electric generator was connected directly to the gasoline engine of the bus to provide electrical energy for motors which drove the rear wheels. Thus the primary source of the electrical energy was on the vehicle itself and no system of overhead wires or contact rails was necessary to connect the vehicle with a fixed generating station. With the development of the diesel engine came a great expansion of the electric-drive principle for buses. In 1940 there were about 1,700 gas-electric buses in operation in the United States and Canada and about 1,000 diesel-electric buses.

The electric-drive principle with both gasoline and diesel engines as the primary source of power has been widely employed also on trunk-line railroads. Many switching engines have been built with diesel engines driving electric generators. More recently in the U.S. the same type of power has been employed to haul crack high-speed passenger trains such as the "Zephyrs" operated by the Burlington, the "Rockets" of the Rock Island, the "Super Chief" of the Santa Fe, the "Streamliners" of the Union Pacific and the "Capitol Limited" of the Baltimore & Ohio.

Electrified Trunk-Line Railroads.—New developments in the field of electrified trunk-line railroad operation have been relatively few in recent years. While there are more than 6,000 mi. of electrified trunk-line track in operation in the United States there have been no important extensions since the Pennsylvania railroad completed the electrification of its main line between New York and Harrisburg. This lack of activity has been due to the high cost of constructing facilities for electric operation and to the popularity of the new trains operated by diesel-electric power. In Europe there had been, prior to the war, somewhat more interest in railroad electrification, due to the availability of hydroelectric power and the desire to cut down the use of fuels which had to be imported. Even there, however, the use of diesel power tended to retard expansion of railroad electrification.

Trends.—Before the advent of the automobile and the motor bus the electric surface railway provided by far the fastest and most comfortable transportation service in cities and adjacent communities. In recent years, however, its importance has declined, although it still remains the largest single agency of public passenger transportation. During 1940 the electric surface railways in the United States carried a total of more than 5,000,000,000 passengers, as compared with about 4,000,000,000 on motor buses engaged in comparable service, 2,500,000,000 on rapid transit lines and 500,000,000 on trackless trolleys.

Many studies have been made with a view to determining the logical economic field for the electric surface railway. Generally speaking it is agreed that the large investment in tracks, cars and electrical distribution equipment can be justified only where riding is sufficiently heavy to require frequent service. This condition does not ordinarily exist in small cities, and virtually all such cities that formerly had electric railways have given them up. For the same reason a great many of the interurban electric lines in sparsely settled territory have been abandoned.

Indications are that electric surface railways will not long remain an important factor in United States cities of less than 100,000 population. In cities between 100,000 and 500,000 the future of the electric railway cannot be predicted accurately at this time. About two-thirds of the 80 cities in the United States in this classification have retained electric railway service, while the other third rely upon motor buses or trackless trolleys or a combination of the two. In the cities of more than 500,000

Table II.—*Cities With New Streamlined Street Cars*
(U.S. and Canada—As of Jan. 1, 1941)

City	Number of cars	City	Number of cars
Atlantic City, N. J.	26	Philadelphia, Pa.	153
Baltimore, Md.	156	Pittsburgh, Pa.	301
Boston, Mass.	21	St. Louis, Mo.	100
Chicago, Ill.	83	San Diego, Calif.	28
Cincinnati, O.	30	San Francisco, Calif.	5
Kansas City, Mo.	24	Toronto, Can.	190
Los Angeles, Cal.	125*	Washington, D.C.	222
New York, N. Y. (Brooklyn)	100	Vancouver, Can.	4

*Los Angeles railway 95, Pacific Electric railway, 30.

population the electric surface railway continues to play an i portant part in local transportation, especially in those pla which have little or no rapid transit service.

Trends generally similar to those in the United States were evidence elsewhere throughout the world up to the outbreak war in Sept. 1939. London was contemplating the replaceme of all its remaining tramway lines by trolley buses. Paris h already replaced all its trams by motor buses. Buenos Air with a relatively extensive subway system, was rapidly changi to buses for surface travel. On the other hand, such large cit as Liverpool and Glasgow, with rather limited rapid transit fac ties, continued to rely largely on surface electric railways.

To what extent the war will ultimately affect the trends cities in Great Britain and on the continent of Europe cannot foreseen at this time. One effect already noted has been to tard plans for changing from electric railway to motor buses a trolley buses. This has been due partly to the difficulty of o taining new vehicles from the manufacturers and partly to t difficulty of obtaining fuel for motor buses. Some transit s tems are reported to have withdrawn motor buses and reston street railway service because of the fuel problem.

In the United States and Canada the belief has persisted amo the transit companies in the larger cities that the electric surfa railways will continue to perform a useful service. Since 19 more than 1,500 modern streamlined electric cars have be purchased by transit companies in 16 major cities in those t countries. (J. A. Mi.)

Electrification, Rural: *see* Rural Electrification.
Electron: *see* Chemistry; Physics.
Electron Microscope: *see* Physics: *Electron Microscop*
Elementary Education: *see* Education, Elementary.

Ellerman, Ferdinand (1869–1940), U.S. astronomer, w born in Centralia, Ill., May 13, a attended the University of Chicago where he became professor astronomy. He assisted in planning the Yerkes observatory Williams Bay, Wis., in 1896 and was one of those who equip the Mount Wilson observatory in California in 1904. He mained with this observatory for 33 years. He died in Los A geles, March 20.

Elliott, Harriet Wiseman (1884–), only wom member of the U.S. Advis Commission to the Council of National Defense, was born Carbondale, Ill. on July 10. After taking her bachelor's deg at Hanover (Ind.) college and her master's degree at Colum university, she began teaching political science and history 1913 at the University of North Carolina. In 1918 she was pointed a member of the Women's National Council of Defe and in 1928 she served as a member of the White House C ference on Children. She became dean of women at the Univ sity of North Carolina in 1935. Miss Elliott, who organized first woman's suffrage movement in North Carolina shortly af completing her studies at Columbia, was appointed by Presid

Roosevelt May 28, 1940 to be commissioner for the protection of consumers' interests on the defence council advisory commission.

Elliott, Maxine (1871–1940), U.S. actress whose original name was Jessie Dermot, was born in Rockland, Me., Feb. 5. She was educated in Notre Dame academy, Boston, Mass., where she was advised to assume a stage name. She made her debut with E. S. Willard in 1890. She played in Augustin Daly's company for a time and became known more for her beauty than for her dramatic ability. She was popular and successful, however, appearing in a wide variety of plays from Shakespeare to modern comedy. In 1908 she became the owner and manager of a theatre in New York named for her. Her last appearance in the theatre was in 1920, after which she retired and built a chateau in the south of France. She died March 5, at her chateau in Juan les Pins on the Riviera.

El Salvador: *see* SALVADOR, EL.

Embassies, Great Britain: *see* AMBASSADORS AND ENVOYS: *To and from Great Britain.*

Embassies, United States: *see* AMBASSADORS AND ENVOYS: *To and from the United States.*

Emery. Properly speaking, emery is a mixture of corundum and magnetite, though in some of the inferior grades much of the corundum is replaced by spinel and other minerals. The United States produced 765 short tons in 1939 and imported 1,956 long tons; imports rose to 5,105 tons in the first 9 months of 1940. The best emery comes from Greece and Turkey, each of which exports 10,000–15,000 tons annually. The Greek (Naxos) emery is considered best for grinding wheels, while Turkish is used for general polishing work and emery cloth. Grecian emery goes mainly to Germany and Netherlands, and Turkish to England. (G. A. Ro.)

Emigration: *see* CENSUS, 1940; REFUGEES.

Enderbury Island: *see* SOUTH SEA AND EQUATORIAL ISLANDS.

Endocrinology. The knowledge of those hormones which are protein in structure has lagged behind that of the steroid hormones, because of the relative inadequacy of the methods for the isolation and purification of proteins in general. During 1940 the application of recently developed methods such as the use of the ultracentrifuge and the Tiselius electrophoretic apparatus, made possible the isolation of two of the protein hormones of the anterior pituitary gland.

Two laboratories (Shedlovsky, Fraenkel-Conrat) independently reported the preparation of a pure luteinizing hormone from the pituitaries of swine and sheep, respectively. The substances isolated have the physical characteristics of pure proteins and when tested in female animals give evidence of no other action but luteinization of the ovarian follicle. In the male animal this hormone causes hyperplasia of the homologous cells in the testis. For this reason these authors properly prefer to use the term interstitial cell stimulating hormone (I.C.S.H.) for this substance. This finally establishes the independent existence of I.C.S.H. (luteinizing) as a separate gonadotropic entity from the follicle stimulating hormone (F.S.H.) in the anterior pituitary gland, as previously postulated by Fevold and Hisaw.

The isolation of the growth hormone of the anterior pituitary gland was also reported by Fraenkel-Conrat *et al.*, although the purification of the material has not been perfected to as high a degree as in the case of I.C.S.H. However, only traces of thyrotropic, lactogenic and gonadotropic activity remain, and it seems probable that the growth substance is independent of the hormones responsible for these effects. This separation removes the basis for the conception that the growth promoting action of anterior pituitary extract may be the resultant of the combined effects of the several trophic hormones which it contains, and lends weight to the findings of Freud *et al.* that the growth substance primarily affects the development of the epiphyseal centres of the long bones.

Anterior Pituitary Gland.—Uotila and co-workers continued their work on the mediation of the central nervous system in the activity of the anterior hypophysis. They previously reported that the pituitary stalk is a necessary pathway only for those endocrine reactions which are initiated by the stimulation of nervous receptors, but not for the maintenance of such functions as growth and the trophic influences of the anterior pituitary upon other endocrine glands. During 1940 they further showed that section of the pituitary stalk does not interfere with the action of oestrin in inhibiting the secretion of gonadotropic substances or in producing the typical histological reaction in the pituitary gland. Similarly, interruption of the nervous pathways to the pituitary did not prevent the atrophy of the thyroid gland following large doses of thyroxin, nor did it interfere with the regeneration of residual thyroid tissue after subtotal thyroidectomy. However, the inhibitory action of cold upon the reproductive cycle of rats was not manifested after section of the pituitary stalk.

The production by Young of permanent diabetes in dogs by means of prolonged treatment with large doses of an anterior pituitary extract was reported about 1938, and initiated several new avenues of research. It seemed possible that this type of experimental diabetes might more closely approximate diabetes mellitus in humans than does the classical type of experimental diabetes which follows pancreatectomy. However, it has since been shown that the pancreatic glands of such "pituitary-diabetic" animals exhibit a reduction in size and severe degeneration of the islets of Langerhans, and particularly of the Beta cells to which the secretion of insulin is attributed. From the evidence at hand in 1940 (*cf.* Soskin) it appears probable that the injected anterior pituitary extract evokes a secretion of insulin from the pancreas. The continued administration of increasingly large doses of the extract eventually exhausts the insulin-secreting cells of the pancreas, and apparently permanently incapacitates them. Thus when the treatment is discontinued, the animal's condition closely resembles that of a depancreatized organism, except for the presence of those portions of the pancreas which are not concerned with insulin secretion.

Thyroid.—The general interest in the functions of the anterior hypophysis and the demonstration of the thyrotropic activity of pituitary extracts, tended to focus attention on the control of thyroid secretion by humoral mechanisms. Although the normal regulation of thyroid function may well be determined to a considerable degree in this manner, evidence is forthcoming which indicates that nervous intermediation of thyroid activity may be important in the pathogenesis of clinical thyroid disorders. It was shown by Friedgood and Cannon that in the occasional animal the continued stimulation of the cervical sympathetic nerve following its anastomosis with the right phrenic nerve, may result in a syndrome which duplicates the essential features of exophthalmic goitre in humans. Conversely, bilateral cervical sympathectomy was shown to significantly lower the basal metabolic rates of most of the animals in which the operation was performed (Brock *et al.*).

A beginning was also made on the application of radioactive iodine to the study of normal and abnormal thyroid function. Hertz *et al.* reported, that using this method in rabbits, the normal thyroid absorbed 80 times that amount of administered iodine

which might have been expected to enter the gland on the basis of a uniform distribution throughout the body. The hyperplastic thyroid took up from 300–400 times the distribution value. The curves of the uptake of iodine by hyperplastic thyroid glands differed according to the agent used to produce the hyperplasia. This suggests that there may be functionally different hyperplastic states of the thyroid.

Adrenal Cortex.—Since the earlier recognition that extracts of the adrenal cortex may not be regarded as containing a single active substance, a number of steroids and amorphous fractions have been isolated and identified. A study of the physiological properties of these substances revealed that the various compounds or fractions have certain activities in common. However, a particular compound or fraction may exhibit one activity to the highest degree and be relatively impotent in other respects. It was found convenient to compare the various cortical steroids and fractions according to the following effects obtained upon their administration to adrenalectomized animals (Kendall): (1) the maintenance of life, (2) the restoration of normal carbohydrate levels in all tissues, (3) the restoration of normal sodium and potassium balance and excretion. To these effects may be added the restoration of the ability of the muscles to continue to perform work in response to prolonged stimulation, according to the test developed by Ingle. However, the activities of substances in this respect run parallel with their carbohydrate effects.

During 1940 much of the earlier confusion as to the separation of the above actions was resolved by the demonstration that the factor which primarily affects the mineral balance also exerts a secondary action on the metabolism of foodstuffs. The secondary effects are most readily distinguished from the primary metabolic actions of adrenal cortical substances, by a consideration of those disturbances in the adrenalectomized animal which are alleviated by combating the mineral imbalance with a high sodium and low potassium intake alone. Such treatment was shown to restore to normal the diminished rate of glucose and of fat absorption by the intestine, and to enable adrenalectomized animals to deposit glycogen from glucose in a normal manner (Anderson). The primary metabolic functions of the adrenal cortex, as indicated by those metabolic disturbances in the adrenalectomized animal which persist despite the maintenance of a normal sodium and potassium balance, are concerned with the maintenance of normal carbohydrate levels in the blood and other tissues during fasting. This action of the adrenal cortex depends chiefly upon its influence over the rate of new formation of sugar from non-carbohydrate precursors in the liver. In this connection there is evidence that the adrenal cortex influences the catabolism of protein and the mobilization and catabolism of fat.

Pancreas.—An *in vitro* action of insulin was demonstrated by Gemmill. He obtained glycogen synthesis from glucose in the isolated muscle from rat diaphragm. In view of the increasing knowledge of the chemical mechanism of glycogenesis, Gemmill's observation should open the way to the elucidation of insulin action in this regard.

The mode of action of insulin in the intact animal was clarified by the work of Soskin and Levine. They had previously shown that, in the absence of insulin, the characteristically high blood sugar level of the diabetic animal enables it to utilize at least as much carbohydrate as the normal animal utilizes at its lower normal blood sugar level. During 1940 these authors reported on the effect of large doses of additional insulin on the sugar utilization of normal animals. They found that administered insulin does not increase the rate of sugar utilization although it does increase the storage of glycogen. Thus the amount of insulin available in normal animals is apparently sufficient for the maximal rate of glucose catabolism, but not sufficient for maximal glycogen synthesis. They concluded that insulin is n primarily concerned with the oxidative breakdown of carb hydrate. It probably facilitates the formation from glucose of a intermediate substance (phosphorylated hexose?) which preced and is necessary for both catabolism and synthesis.

Ovary.—The methods for studying the metabolism of survi ing tissue slices *in vitro,* have been applied to the problem of t metabolic fate of the oestrogenic hormones. Heller showed th oestrone, which is secreted by the ovarian follicle, is changed oestradiol by various tissues. Oestradiol is then broken down b oxidative reactions, primarily in the liver. When tested on ca trate female animals, oestradiol is weight for weight about times as effective as oestrone. Thus when the liver is damage the oestrone secreted by the ovaries is changed to the more p tent oestradiol, but the latter is not broken down as rapidly under normal conditions. This probably explains why ma patients with extensive liver damage tend to show evidence increased oestrogenic activity, such as feminine distribution hair and gynaecomastia.

It is known that the normal menstrual flow depends up many factors. The cells lining the uterus proliferate under t influence of oestrin secreted by the developing follicle in t ovary. After ovulation has occurred the hormone of the corp luteum further stimulates the uterine lining to cell proliferati and increased secretion by the uterine glands. Just before me struation the uterine lining is thick, spongy and its blood vess are dilated and filled with blood. It is prepared, therefore, f being shed in the menstrual flow. It is evident from the abo that disturbances in the amount or quality of ovarian hormon may cause a cessation of menstruation, or amenorrhoea. The are, however, cases of amenorrhoea in whom no endocrine d turbances can be found. The therapy of such cases has hither been unsatisfactory.

Studies on the nature and mechanism of the oestrus cycle animals showed that the hyperaemia of the uterus plays an i portant role in certain of the uterine changes during the cy (Hechter, Lev and Soskin). This hyperaemia is normally brou about by the stimulating effect of oestrin on the local secreti of acetylcholine by the nerve endings of the autonomic nerves the uterus (Reynolds). The presence and degree of the hyp aemia might, therefore, depend also on the state of the autonom nervous system at the time of oestrin stimulation.

Since the degree of hyperaemia could well be a determini factor in setting off the menstrual flow in humans, it seemed po sible that those cases of amenorrhoea without evident endocri disturbances, might lack adequate amounts of the normal hyp aemic stimulus, acetylcholine. Accordingly, a group of such cas was treated with prostigmine, a drug which inhibits the destru tion of acetylcholine in the body. This treatment uniformly r stored the menstrual flow, and it had no effect whatever in cas of amenorrhoea due to pregnancy (Soskin *et al.*). (*See* al PHYSIOLOGY; ZOOLOGY.)

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England: *see* GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

English Literature.

During 1940 the effects of the war began increasingly to make themselves felt upon literature, and notably fewer serious books were published. After a year of war, however, quality had remained largely unaffected; and although the increase in book prices and the closing down or suspension of certain well known publishing houses were observed with regret, the defeat of a proposal to make books liable to the purchase tax was an encouraging sign for a somewhat uncertain immediate future.

Belles lettres, not surprisingly, suffered the most extensive eclipse. George Orwell's *Inside the Whale* was almost the sole representative of the critical essay, and G. B. Harrison's *Elizabethan Plays and Players* was the only important addition to the usually prolific field of historical dramatic criticism, although in *Rare Prologues and Epilogues* Prof. Audrey Wiley compiled a useful anthology of her neglected subject. Poetry appeared in little greater abundance, and T. S. Eliot's *East Coker,* a didactic introspection in his best manner, was the only new work of importance; although John Betjeman was as felicitous as ever in *Old Lights for New Chancels,* and Sean O'Casey full-bloodedly propagandist in *The Star Turns Red.* The deaths of Humbert Wolfe and W. H. Davies, both of whom possessed a fine sense of words and enjoyed, in their heyday, a considerable public repute, took place during the year.

History and historical biography enjoyed a good year. In *The Eighteenth Century Background* Basil Willey provided a subtle, acute and exceedingly interesting guide to the study of the period, while the publication of *Letters from George III to Lord Bute* (introduced by Romney Sedgwick) threw valuable light on a misunderstood relationship. A lighter aspect of the century was pleasantly sketched by Willard Connely in *The Reign of Beau Brummell;* and although R. W. Ketton-Cremer's *Horace Walpole* revealed nothing new about its subject, it usefully restated the old. Other periods were not so well covered; but one noticed Carl Burchardt's great life of Richelieu, H. W. Parke's erudite *History of the Delphic Oracle,* G. G. Coulton's *Studies in Medieval Thought,* Hugh Ross Williamson's entertaining *George Villiers,* Michael Prawdin's *History of the Mongol Empire* and Sir Percy Sykes's definitive *History of Afghanistan.* Among modern biographies were hagiographic studies of Oscar Wilde, Field Marshal Mannerheim and Neville Chamberlain, by Lord Alfred Douglas, Tancred Borenius and Derek Walker-Smith respectively. Autobiographies were few, and only Havelock Ellis's *My Life* and Gilbert Frankau's *Self-Portrait* were by writers distinguished enough to deserve much attention.

Politics continued, as might have been expected, to hold a disproportionately important place amongst the year's books. There was still little check to the spate of tracts against naziism, but amongst their very numerous company only F. Borkenau's *The Totalitarian Enemy* seemed to have the detached and analytical approach that raises political philosophy above political journalism. The best of the lower ranks was Douglas Reed's *Nemesis?,* an entertaining biography of Otto Strasser, Hitler's rival and former colleague. One must also remember Sir Neville Henderson's *Failure of a Mission,* an uninspiring account of the negotiations that preceded the war, which gained considerable importance by being issued with cabinet approval. Besides the conventional denunciations of Germany, there was also an equally numerous flock of pamphlets extolling the invincible Maginot line and the unconquerable spirit of France that it would be unkind to particularize. It was too soon after the event to expect detailed explanations of the French collapse; and save for *The Last Days of Paris,* an exceptionally vivid piece of reporting by Alexander Werth, very little of value was published on this subject. The general political field received a good deal of attention, and the debate for and against federal union continued at full strength, with D. N. Pritt's *Federal Illusion* as the ablest of the opposition. H. G. Wells, too, continued to develop his scientific socialism in *The New World Order,* and William Gallacher, the communist M.P., made *The Chosen Few* an effective political testament.

General science was sparsely represented, but *The Naked Nagas* by Christoph Fürer-Haimendorf and *The Swazi* by Brian Allan Marvick combined travel, adventure and cultural anthropology in very readable proportions. Also in the anthropological category was Mass Observation's *War Begins at Home,* an excellently arranged study of the average man's reactions to the disturbing new problems of the first months of war.

Fiction, as usual, was exceedingly plentiful. L. H. Myers (*The Pool of Vishnu*), Graham Greene (*The Power and the Glory*), R. C. Hutchinson (*The Fire and the Wood*), Sinclair Lewis (*Bethel Merriday*) and Elizabeth (*Mr. Skeffington*) all published new novels worthy of their previous reputations, while in *The Bridge in the Jungle* the mysterious B. Traven once more demonstrated the possibility of selling half a million and remaining a good writer. Translations were unusually prominent, and Henri de Montherlant's *The Lepers* (sequel to that remarkable tour de force, *Pitié Pour Les Femmes*) and Hans Fallada's *Iron Gustav* —one of the last novels to come out of Germany—were deservedly well received. The upper level of fiction was, perhaps, higher than that of 1939 and admirable novels of the second rank included *The House of Markku* by Unto Seppanen, *I Shall Not Want* by Norman Collins, *The Devil in Green* by Gina Kaus, *Fanny by Gaslight* by Michael Sadleir, *Basilissa* by John Masefield and *The Chosen* by Edith Simon.

Although the last quarter of the year was marked by the beginning of the great air-raids on London, there was no noticeable diminution in autumn and winter publishing. Criticism and belles lettres were particularly well represented; and distinctive publications in this field ranged from *English Wits,* a collection of light, analytical essays by Desmond MacCarthy, Robert Lynd and others upon Sheridan, Hook, Wilde and their famous rivals; to Logan Pearsall Smith's carefully polished *Milton and his Modern Critics,* and M. C. Broadbrook's and M. G. Lloyd's learned little study of the poet Marvell. Prof. George Gordon Coulton, temporarily deserting his economic studies, published an unusual and suggestive history of mediaeval Latin, *Europe's Apprenticeship;* and in *Coleridge Fille,* a biography of Sarah Coleridge, Earl Leslie Griggs traces the influence of that remarkable and unquenchable man upon his immediate family. Poetry was little in evidence, but in his new translation of the *Georgics* of Virgil, Cecil Day Lewis displayed once more his metrical skill and felicity.

In other literary fields there was little noteworthy of mention, though *Pack Up My Bag,* Henry Green's autobiography, received a good deal of attention. In fiction, H. E. Bates's latest volume of short stories, *The Beauty of the Dead,* was widely praised; and Charles Morgan's new novel, *The Voyage,* was still more widely reviewed. (*See* also AMERICAN LITERATURE.) (J. MR.)

Entomology.

Economic Entomology.—The most important trends in economic entomology during the year 1940 have been along toxicological lines and especially in the development of new insecticides for the control of insect pests. These new discoveries have had far-reaching effects in the fields of agricultural, household, veterinary and medical entomology.

Insect-transmitted virus diseases of plants have been given much attention which has resulted in new ideas of the possible origin of life.

Insecticides.—Tartar emetic, $SbOKC_4H_4O_6$, has been found effective in the control of certain thrips, including the injurious citrus thrips, *Scirtothrips citri* (Moulton), of middle and southern California and the gladiolus thrips, *Taeniothrips gladioli* (Moult. & Steinw.), of widely separated areas in the United States and Canada. The material is applied as a spray and has little or no serious effects upon the plants treated.

The dinitro phenol and cresol compounds experimented with as ovicides for aphids have given seemingly good results and are being extensively used in various parts of North America in the destruction of eggs of *Hyalopterus arundinis* (Fab.), *Aphis pomi* (De Geer) and *Aphis rosea* (Baker) on dormant deciduous fruit and ornamental trees.

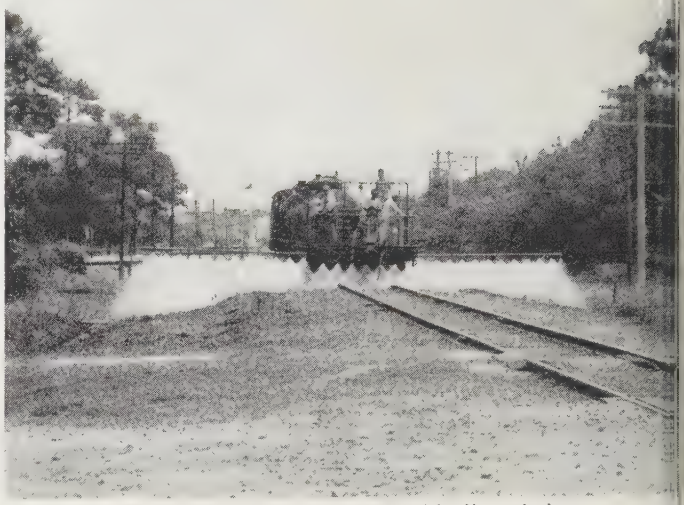
These chemicals are replacing to some extent the coal tar sprays because they are less toxic and injurious to the operators of spray equipment.

Methyl bromide fumigation has been greatly extended during the past few years and has reached vast proportions in connection with the fumigation of fruits and plant materials shipped in carload lots. In the handling of plant materials originating in the areas infested by the Japanese beetle and the white-fringed weevil some 4,000 cars were treated during 1938–39. This material is also extensively used for fumigating granaries, mills and warehouses for insects infesting stored products and is also being tested for soil-infesting species.

Tree Injection with Chemicals.—The introduction of chemicals into trees for the destruction of barkbeetles and other wood-boring insects and fungi and for the prevention of infestation by these organisms has received considerable attention both in Europe and in North America.

Copper sulphate, arsenicals and other toxic chemicals are administered to living and recently felled trees. Young trees to be utilized in the natural condition with the bark intact are so treated. Considerable work has also been done by Fisher in England in preserving timber against insect attacks by the removal of the starch by steaming and curing.

Plant Virus Diseases Transmitted by Insects.—This world problem is receiving a great deal of attention from botanists, plant pathologists, entomologists, physiologists and physical chemists. Great strides have been made as a result of their studies, research and publication, as well as by those made in the medical and veterinary fields of virus affecting humans and other animals. Viruses were first discovered in 1892. During 1940 Stanley showed for the first time in North America an X-ray photograph of the discrete particles of the tobacco virus, a single particle of which measures 15 millimicrons in cross-section an about 330 millimicrons in length. According to Stanley (1940 a purified plant virus is subject to chemical analysis the composi tion of which includes 50% carbon, 7·5% hydrogen, 16% nitro gen, 0·2 to 2·2% sulphur and 0·5 to 4·1% phosphorus.



RAILROAD SPRAYER operating for white-fringed beetle control

By means of very careful and exacting technique plant viruse have been examined most critically, and a number of distinc strains are recognized for many. For instance, there are no four distinct strawberry viruses indicated as Fragaria virus to 4. While plant viruses are transmitted by many insects, th most important vectors are aphids and leafhoppers. The gree peach aphid, *Myzus persicae* (Sulzer), appears to be involve more than any other single insect.

Insects as Food for Birds and Other Animals.—During th years there have been ever-increasing demands for insects as foo for birds, fishes and other animals. These demands have create a market which has been largely supplied by foreign countries. I has not been possible to ascertain the volume or value of thes commodities nor is it possible to procure data as to the exten to which these insects are commercialized. An importer, S. F Abernethy, has furnished some information which may giv an idea of the kinds used in the United States during the pas year.

Mealworms.—*Tenebrio molitor* (Linn.) and other species con stitute one of the most important foods for small domestic ani mals. They are sold in living condition. While they are raise extensively in relatively small lots in the United States, they hav in the past been largely imported from Holland where they ar reared in great quantities, but never sufficient to supply all o the market demands. Larvae of the broad-horned flour beetle *Gnathocerus cornutus* (Fab.), are also reared commercially t feed young birds in Europe.

Ant Eggs.—These are in reality the pupae of the common re wood ant, *Formica rufa* (Linn.), which builds large mounds o nests in the forested areas of Europe and North America. Thes nests are often very large and may contain as many as 100,00 individuals. By controlled robbing, the nests may be kept at relatively high productivity.

The world supply is produced chiefly in Finland which control the market. These dried ant pupae are generally used in feedin young birds and other animals.

Mexican Dried Flies or Water Boatmen (*Corixidae*).—Unde these general terms are included fresh water insects, particularl the water boatman most often adulterated with fairy shrimp

METAL BARRIERS used to control crickets

(*Anostraca*?), and backswimmers (*Notonectidae*). From 25 to 50 tons are imported annually into the United States.

Biological Control.—The development of biological control methods for the subjugation of insect and plant pests has continued with considerable headway during the past 20 years and has reached a peak of great importance in the world of economic entomology. This method has recently been extensively employed in connection with many important insect and weed problems such as the gypsy and brown tail moths, the Japanese beetle, the sugar cane borer, the oriental peach moth, the woolly apple aphid, the European earwig, the European elm leafbeetle and the European spruce sawfly in North America; sugar cane and fruit insects in Hawaii; fruit flies, woolly apple aphid, St. John's wort and prickly pear in Australia; prickly pear and many orchard insects in South Africa; and like problems in other geographical areas. Special emphasis has been placed upon the use of *Trichogramma evanescens* (Westwood) as an egg parasite of many destructive moths and particularly the sugar cane borer and cereal-infesting insects.

Medical Entomology.—The recent establishment of the Juan Mina Entomological station of the Gorgas Memorial laboratory in the Panama Canal Zone extends the arm of research deeper into the problems of tropical medicine.

Yellow Fever Service in Brazil.—The Rockefeller Foundation, in charge of the yellow fever service in Brazil, relinquished this service to the Brazilian National Fever service, ministry of education and health, at the end of the year 1939. (*See* also MALARIA.)

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Epidemics and Public Health Control.

Further progress in the knowledge of infantile paralysis was made when Armstrong reported the successful transmission of the Lansing strain of poliomyelitis through 12 generations in white mice after adaptation to the eastern cotton rat. (*See* also INFANTILE PARALYSIS.)

Cox and Bell reported successful immunization of guinea pigs against Rocky mountain spotted fever with vaccines prepared from infected tissues of the developing chick embryo. Similar satisfactory results, using essentially the same method, were obtained with epidemic (European) typhus, and somewhat less conclusive results with endemic typhus.

Felton prepared an antigen from the polysaccharide of the pneumococcus germ and immunized 60,000 humans in the CCC and U.S. army. About 72,000 persons were used as controls. In the inoculated group, the incidence of pneumonia was reduced 50% as compared with the non-inoculated group, and the case fatality was lower in the inoculated group. Felton further studied this problem and found that of 1,099 individuals, 94% to 98% showed antibodies in the blood after inoculation, as compared with only 32% of this group that showed serum antibodies before inoculation. Of the individuals inoculated, 1% to 5% failed to develop antibodies. Felton believes that these people in the general population who would fail to react to inoculation to the antigen, or who would react poorly, may be the ones who develop pneumonia. Further studies on this important piece of work were under way in 1940.

Recommended protection for obtaining immunity against diphtheria was suggested by the American Public Health association after a sub-committee study. For children under school age, two doses of alum precipitated or three doses of plain toxoid at one month intervals were suggested.

A reinforcing dose should be given when the child is ready to enter school.

The massive dose treatment of early syphilis by intravenous drip method as reported by Hyman *et al.* was being intensively investigated. Hyman and his co-authors reported favourable results. The advantages of the massive dose treatment, should it prove safe, practical and effective, hold the possibility of greater convenience, greatly shortened period of infectivity, and a course of therapy to be measured in days rather than in months. It was too soon in 1940 to judge the ultimate effect of this method of treatment, although the group of cases followed for a period of five years appeared to be clinically and serologically cured. (For syphilis control *see* VENEREAL DISEASES.)

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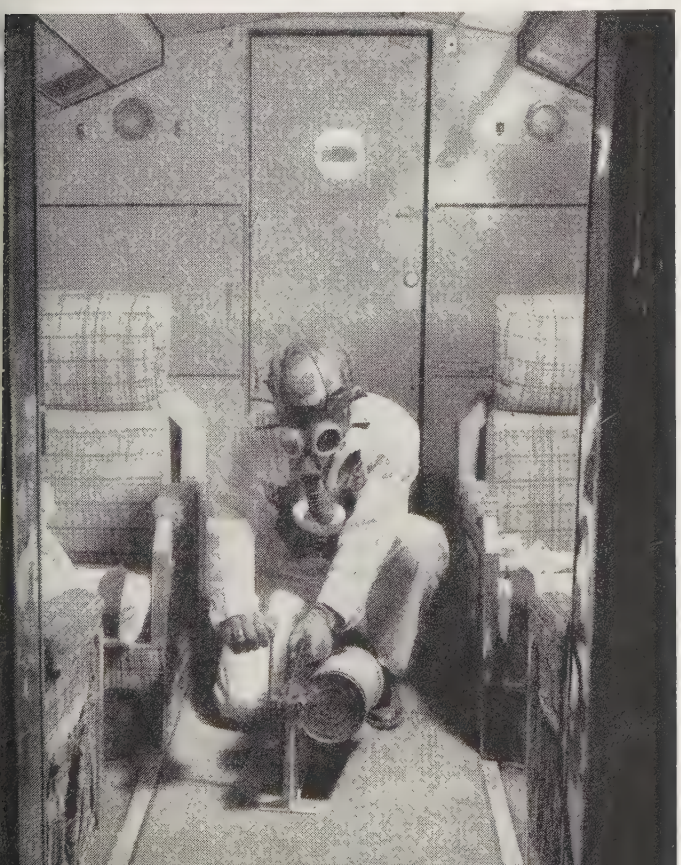

CLIPPERS of the Pan American Airways arriving at Miami from South America are fumigated with potassium cyanide gas to prevent transmission of the yellow-fever mosquito into the United States

Episcopal Church: *see* PROTESTANT EPISCOPAL CHURCH.
Equatorial Islands: *see* SOUTH SEA AND EQUATORIAL ISLANDS.
Eritrea: *see* ITALIAN COLONIAL EMPIRE.

Estigarribia, José Felix (1888–1940), president of Paraguay, was born in Caraguatay, Paraguay, Jan. 21. He entered the army at the age of 21 and after serving three years entered the École de Guerre in Paris in 1924; when he returned home four years later he was made chief of staff. He served in the war with Bolivia over the Chaco boundary and was promoted to commander-in-chief of the army.

Within a year of the truce of 1935 he was exiled following a revolution. Recalled in 1937, he was appointed minister to the United States. He was elected president April 30, 1939, and was inaugurated Aug. 15. In July 1940, he signed a new constitution

centralizing administrative control.

He was killed Sept. 7, when the plane in which he was flying with his wife from the capital to his country residence crashed to the ground.

Estonia, country of north-central Europe, N. of Latvia; area, 18,371 sq.mi.; population (est. Jan. 1, 1939) 1,133,-940. Chief towns: Tallinn (capital, 145,000); Tartu (60,800); Narva (24,000); Nomme (21,900); Pärnu (21,800). Language, Estonian; religion, Christian (Lutheran 78%, Greek Orthodox 19%).

History.—Ever since its declaration of independence, Feb. 24, 1918, Estonia has been shadowed by the fear that some day the Russian bear would again embrace it. The first approaches had been made when on Sept. 29, 1939, the little country was impelled to sign with the U.S.S.R. a new "treaty of mutual assistance and trade."

By the terms of this agreement Russia obtained the right to lease naval and air bases on the islands of Dagö and Ösel, and the town of Paldiski. This treaty, the repatriation of 12,000 German Balts from Estonia to the reich and the war between Russia and Finland were sufficient evidence to the Estonians that they could no longer hope to live their own lives.

On the 14th and 15th of July, 1940, Estonia, like its sister states to the south, held an election to determine whether it would apply for admission to the soviet union. It was virtually a referendum, and the conclusion taken for granted. In order to roll up a really impressive vote the "workers' bloc," supervised by the Russian commissar, A. A. Zhdanov, put forth a program of social reform and proclaimed "All power to the people and to the people only. Fight for the peace and happiness of Estonia and of the soviet union."

In due course Estonia was accepted as a republic of the U.S.S.R., and early in September the soviet government ordered U.S. consular and diplomatic officials out of the country. The United States had already frozen Estonian assets in the U.S.A., and Great Britain had retained the Estonian shipping found in her harbours.

Banking and Finance.—Revenue (est. 1939–40), 105,878,187 kroons; expenditure (est. 1939–40), 105,816,637 kroons; public debt (March 31, 1939), 127,292,630 kroons; notes in circulation (Aug. 31, 1939), 57,000,000 kroons; gold reserve (Aug. 31, 1939), 40,900,000 kroons; exchange rate (1939), 18·11–18·35 kroons (Ekr.) = £1 sterling.

Trade and Communication.—Imports (1939), 101,351,000 kroons; exports, 118,217,000 kroons. Principal imports were manufactured goods, iron and steel, raw cotton, fertilizers, sugar; principal exports were butter, cellulose, timber, flax, meats, eggs, cotton goods.

Agriculture.—Production (1939; in metric tons): rye, 227,-657; potatoes, 874,252; oats, 149,448; barley, 90,042; wheat, 85,257. In the year 1939 the country counted 705,000 cattle; 694,000 sheep; 442,000 pigs; 218,000 horses; 1,991,030 poultry.

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(F. D. S.)

Etching. During the year 1940 the art of etching, as all other forms of creative expression, felt the inevitable effects of the war. Although man's need for pictorial utterance, and the aesthetic satisfaction to be derived therefrom, will persist as long as he himself endures, the atmosphere most conducive to it suffers from existing conditions, which the artist is the first to feel. Undoubtedly the etchers of continental Europe continued to work throughout the year, but the curtailment of communication between countries rendered it well-nigh impossible for the western world to know what they have done. Spain, exhaus by internal conflict, fearing to be drawn into the greater one a with many of her artists fugitives in other lands, produced pr tically nothing in the field of black and white; Italy, absorl with critical national problems, had neither time nor heart art; the Scandinavian countries, the home of flourishing grap schools prior to 1940, were either living under the domination a foreign power or else in dread of so doing, and little of imp tance was produced by the etchers within their borders.

The suppression of personal liberty and the tendency towa regimentation of thought as well as of life that are part of regime in Germany were death to creative art, and the great living German etcher, Kaethe Kollwitz, was in 1940 an ag woman unable longer to give of her genius. Karl M. Schulthe a conspicuous figure, was a refugee in the United States. Pola Hungary and Czechoslovakia, where healthy schools of etch existed in the past, were no longer heard from. So, too, Belgiu Bulgaria and Holland, all of whom produced significant work 1939, had little to show for 1940. Mukul Dey, the Indian etch published work in 1940.

France.—The tragedy of France was reflected among h artists, some of whom died while most of the remainder livi within the former boundaries of that country were largely ina tive in their respective fields. Between Jan. 1, 1940 and the c lapse in June, the etchers Adam, Berg, Bonnard, Boullaire, Car Goërg, Grandgérard, Guastalla, Laurencin, Legrand, Lévy, L. Moreau, Myr, Possoz, Rouvière, Villon and Vuillard were pra tising their art.

Great Britain.—In the midst of war and the threat of invasi British etchers carried on with splendid courage. Not only c those of established reputations publish new work, as Ca Cowern, Dent, Drury, Dodd, Fisher, Freeth, Gross, Hard Heath, Janes, Patrick, Robins, Rushbury, Smart, Spencer a Taylor, but such less familiar names as Archer, Brasham, Clilver Deakins, Orr, Phillip, Platt, Shaw and Spaull appeared in curre print catalogues. The Royal Society of Painter-Etchers and E gravers held its usual annual exhibition. It is noteworthy that t British school of etching, distinguished for its conservative a traditional approach and highly developed technique, continu to be perhaps the most homogeneous in the world.

Latin America.—While comparatively little was being done the field of etching in the South American countries—thou Uruguay boasts a few native artists in this medium—Mexico w conspicuous for its graphic art. The woodcut and the lithogra appear to be the most popular forms, with some emphasis aquatint, but Guzman, Maldonado, Ocampo, Vazquez and Vela quez Cueto produced etchings that appeared in various exhibitio both at home and abroad.

United States.—Greatest activity was in the United States an it is interesting to observe how many new names appeared duri 1940 in the numberless exhibitions throughout the country. Whi Allen, C. W. and N. Y. Anderson, Auerbach-Levy, Bacon, Be danier, Besedick, I. and R. E. Bishop, Bobleter, Borne, Botk Brooks, Browne, Butler, Chamberlain, Cook, Costigan, Dani Eames, Eby, Fabri, Frame, Gallagher, Ganso, Grant, A. Ha Heil, Heintzelman, Higgins, Hobbs, I. D. Hoffman, Hutty, Ka pel, Kloss, Kupferman, Landeck, M. Lewis, Loggie, Lucio Meyerowitz, H. Miller, Modrakowska, McNulty, Nisbet, Os Ostrowsky, Petersen, Raskin, Renouard, Rosenberg, Roth, Ryde Schaldach, Sloan, Soderberg, Sterner, Swann, Tittle, Tuttle, Va gish, Washburn, S. M. Weber, Williams, Winkler, Woiceske, G. H Wright and M. Young all continued their work, the previous well known L. Boyer, Brown, Budd, Com, Cooper, Friedlande Green, Hagedorn, Hee, Helfensteller, G. A. Hoffman, Howar Jackley, Johnson, Leedy, N. Levy, Malone, Meyer, Nakamiz

Palenske, Peirce, Rocker, Rogers, Sarkadi, M. C. Schutz, Sharp, Sherman, Shopen, Stone, Weidener, Wheeler, Wilbur and Willson published and exhibited.

A group of 26 print makers, among them a number of etchers, exhibited 42 prints at their annual exhibition at the Honolulu Academy of Arts.

The numerous print societies all over the United States, principal among which are the Society of American Etchers, the Chicago Society of Etchers and the Print Makers' Society of California, held their annual and travelling exhibitions during 1940. In addition, important exhibitions of prints were conducted by the National Academy of Design, under the auspices of the American National Committee of Engraving and under government administration.

In Canada the Society of Canadian Painter-Etchers and Engravers continued active. (J. T. Ar.)

Ethical Culture Movement. A new type of religious fellowship, founded in New York in 1876 by Felix Adler, and in London in 1886 by Stanton Coit. Instead of agreement on a common theological creed, the basis is "dedication to the ever-increasing knowledge, love and practice of the Right." Extension of ethical knowledge is considered equally important with improvement of practice in personal, social, political, national and international relations. The American movement is represented by active societies in New York, Chicago, St. Louis, Philadelphia, Brooklyn and by groups in West Chester and elsewhere. These are united in the American Ethical union (secretary, George E. O'Dell; headquarters, 2 West 64th st., New York), which holds annual conferences and publishes a monthly magazine (*The Standard*) and other literature. The Ethical Culture movement pioneered in establishing social settlements, district nursing and legal aid to the poor, housing reform and improved methods of education. In 1939–40 much work was done in aiding refugees from Europe. The New York Ethical Culture society organized the Good Neighbor committee (interdenominational) for this and other co-operative purposes. Summer "work-camps," in which young people of different national and cultural origins are assembled, are being held as experiments in democratic living, to supplement winter studies for the understanding and defence of American institutions. The English Ethical societies are organized in an Ethical union (chairman, Lord Snell, 12 Palmer st., London, S.W.1.).

Bibliography.—*Fiftieth Anniversary History of the Ethical Culture Movement* (ed. H. J. Golding, New York, 1926); G. Spiller, *The Ethical Movement in Great Britain* (London, 1934); *Ethical Religion: Its Basis and Possibilities* (ed. A. Black, 1940). An extensive literature has been produced by Felix Adler, W. M. Salter, Stanton Coit, Walter Sheldon, A. W. Martin, H. J. Bridges, Percival Chubb and others.

(Ho. J. B.)

Ethiopia: *see* Italian Colonial Empire.

European War. The stagnation which had descended on the so-called western front in the early autumn of 1939 after the German conquest of Poland, continued through the opening months of 1940. Great armies remained immobilized behind the Maginot line in France and the Siegfried line in Germany. Action between these lines was confined to reconnaissance patrols, sometimes in some force; to sporadic artillery duels and to air raids. The tension and intermittent alarms of a possible invasion of the Low Countries by the nazis continued like the ebb and flow of a chronic fever, after the first crisis in Nov. 1939.

The sea and air wars continued their undramatic course. Occasional air raids across the North sea directed at military and naval objectives by both sides were the principal warlike activities, while the unremitting, but largely unheralded pressure of the Allied blockade of Germany and the German submarine and mine counterblockade of England grappled its tenacious way through the winter storms and fogs.

Conclusion of the Russo-Finnish War (*Jan. 1–March 13, 1940*).—The situation in Finland at the end of 1939 continued substantially unchanged through the first month of 1940. The swift moving Finns inflicted further losses on the Russians on various fronts, but the intense cold of one of the hardest winters Europe had known in years was equally effective in checking operations. Russian bombing attacks continued intermittently, and a vast wave of sympathy for the gallant Finns swept all over the western world (except in Germany). Beyond some 10,000 volunteers and considerable supplies and equipment from Sweden, very little of this sympathy was translated into practical help for the Finns on the fighting front.

Whether it was due to a reported transfer of the Russian command to the hands of General Gregory M. Stern of the far eastern soviet army, or to other causes, a change in Russian tactics began to appear toward the end of Jan. 1940. The first change was evidenced by the appearance of far better equipped Russian troops, men of much better fighting spirit, discipline and efficiency. This was followed by evidence that the scheme of simultaneous attack at many points on a wide front was being abandoned in favour of a tremendously concentrated, unrelenting attack, regardless of cost, on the Karelian isthmus (Mannerheim line) front. Russian aerial tactics improved. The bombing attacks were more concentrated and were systematically directed, as had been those of the Germans in Poland, on ports, rail centres, etc., of direct importance to the supply and communications of the Finnish front line forces.

Virtually the full weight of Russian attack early in February was poured on various sections of the Mannerheim line. Enormous concentrations of artillery fire and heavy aerial bombing were followed by wave after wave of mechanized and assault troops. Attack after attack was beaten back by the valiant Finns, but new Russian forces kept coming on over the bodies of their fallen. At last the Russians were using their numerical superiority intelligently, albeit ruthlessly. Toward the end, the attack was continuous night and day. Deprived of rest by lack of adequate replacements and by disruption of their communication lines, the Finns were finally worn down and beaten back.

As key positions were taken, fresh Russian troops fanned out to spread the attack, forcing the Finns back past the narrowest point on the Karelian isthmus. From then on, as the Finnish front lengthened, their effectives dwindled. Finally they were fighting in Viipuri itself, the cornerstone of the Mannerheim zone and a vital communications centre. For a flickering moment there was hope that the Anglo-French Allies would come to the Finns' aid, but Germany made it known that she would treat passage of Allied troops across Norway and Sweden as a hostile act by those nations and act accordingly. For the Finns themselves such a development would probably have added Germany to her Russian foes long before any Allied troops could have reached her. Through the intermediary action of Germany an approach was made to the soviet government and on March 13, 1940, Finland gave up her gallant but hopeless fight.

The terms of peace gave Russia virtual military control of Finland, including cession of areas which Russian forces had not even occupied. Loss of the entire Karelian isthmus, including Viipuri (Viborg) deprived the Finns of their principal fortified zone. Cession of a strip north of Lake Ladoga precluded erection of a new defence line. In the north it was agreed that a railroad should be built, connecting the Russian Leningrad-Murmansk line with the Gulf of Bothnia. This line across Finland was the very line of defeated penetration which had cost the Russians so

dearly. The naval base at Hango was leased to Russia and rights of passage across the Petsamo district were also conceded.

The relationship of this Finnish adventure to the main struggle was shrouded in mystery. It was, however, evident that Russian political intelligence had erred grossly in leading the soviet government to expect little or no resistance. It was surmised that German intelligence was better informed, but there were rumours that Germany had encouraged the adventure. Russia had gained greatly, with small effort, from the Polish campaign and quite evidently had been a disappointment to Germany as a source of supplies. It may well have seemed to the German fuehrer that a costly minor adventure might make his quasi-ally in Moscow more co-operative. Neither Russia nor Germany ever admitted that the latter had rendered any military assistance to the former during the Finnish campaign. But with the coming of spring, the main war once more became the chief preoccupation of the German high command.

By February, continuance of the Finnish war was increasing popular pressure in Britain and France to send armed aid to the Finns and that support would have to cross Scandinavia, using the railroad from Narvik through the Swedish iron ore districts which were supplying most of Germany's high-grade iron ore. The risk that the Allied troops in Scandinavia would seize the opportunity to take over the iron mines and also to establish a base for attack on Germany's coast was obvious. This mixture of fact and surmise logically culminated in two conclusions: (1) Germany facilitated the peace arrangements between Finland and Russia; and (2) Germany made acceptance of Russian terms inevitable by effectively preventing Norway and Sweden from agreeing to passage of Allied troops to aid the Finns. Thus, the Finnish peace cleared the decks for the next phase of the main war.

The Final Decision for "Total War."—In retrospect, the winter of 1939–40 recalls the centre of one of those tropical hurricanes which is dead calm, and which, as it passes over any area, gives there an illusion of the end of the storm. Actually, this fictitious calm presages the coming of the equally violent area of the hurricane on the other side of the calm centre. Except for the war at sea, the conflict between Germany and the Allies had withered away to such obscurity and quietness that there were days when certain New York papers had no war news on their front pages. Even the war at sea and the submarine losses became relatively negligible. At this moment a powerful peace effort took shape.

Its actual origin is still one of the undisclosed diplomatic stories of the war and has only indirect connection with the war itself, but certain known facts are significant in throwing light on aspects of national morale and calculations as to policy which influenced the most momentous decision regarding the conduct of the war since that made by Hitler in Aug. 1939 to risk a European conflict. When the war began, a basic belief in the western world, particularly in Britain and in neutral U.S., was that ti was on the side of the Allies; and that the power of defen was so great, as represented by the Maginot line and the defen of Belgium, if that neutral should be invaded, that the Germa could not win a quick decision in the field. In short, the id was that Germany would certainly lose and be destroyed by long war and probably could not win the desperate gamble an attack in the west.

The winter of inaction shook this belief. First, the Russi benevolent neutrality and Italian nonbelligerency raised doul as to the efficacy of the power of blockade. Second, it becan apparent that Germany's internal strength, both as to mora and material supplies had been underestimated. Third, the actu test of inactive war began to put unexpectedly greater strai on the economy and morale of the Allies than on those of Ge many. Germans had been for several years on a semiwar bas As long as no major operations were in progress, the inactive w of the winter of 1939–40 wrought slight change in German li and economic activity. The reverse was true of the Allies.

Early in 1940 prominent U.S. industrialists, having importa interests and markets on the continent of Europe and in Brita nearly ruined by the state of war, returned to the United Stat and expressed the view that a reasonable, factual peace bas for negotiation would find a favourable reception in Berli Certain of these men had interviews with the U.S. presider Franklin D. Roosevelt. Shortly after, the president announc that he was sending Sumner Welles, U.S. undersecretary of sta to Europe to visit Rome, Berlin, Paris and London to obta a firsthand view of conditions and opinions in all those capita and report to him. From Feb. 26 to March 28 Mr. Welles travell on this mission, in a blaze of publicity, but in absolute obscuri as to what he said, did or reported. There is, however, litt doubt that he reported to the president that he found no hop of peace by negotiation.

The British people in particular had become convinced that t destruction of Hitler and the nazi regime was a great moral issu and all history shows that when this conviction really takes ho of the British people, they become almost unbelievably tenaciou In short, in spite of the boredom, the determination of the Allie peoples had hardened considerably since the war began. Som observers believed that a rare phenomenon in democratic nation was evident, the observed fact that, at great crises in nation lives, the inarticulate mass of the people show a keener instin tive appraisal of the existence of irreconcilable fundamenta than do the better-informed minorities who usually mould publ opinion.

The failure to find a receptive basis for the peace feeler which had originated in Berlin, where a negotiated peace on th existing conditions could only represent a victory, led to mo mentous results. The more radical nazi leaders had been favou ing their traditional "dynamism," an "all out" vigorous offensiv to win by one tremendous, swift blow, trampling neutral right and all other obstacles. The more cautious leaders, includin probably many of the army higher command, were well conten with the way things were going. These less reckless Germa leaders urged more patience, organizing Russia's great resource and thereby perhaps vitiating the Allied blockade. They certainl regarded the peace attempts with favour, as even the possibilit of peace discussions strengthened their side of the argument.

The German fuehrer alone could decide. Early in March th British took strong measures to stop the new movement of coa by sea to Italy. Rumours grew that the Allies would disregar Norwegian neutrality, to stop the German ships carrying ore fro Narvik to Germany. On Feb. 16, the crew of a British shi boarded the German ship "Altmark" in Norwegian waters an

Official Estimates of Casualties in European War to Dec. 1, 1940

Nation	Armed Forces				Civilians	
	Killed	Wounded	Prisoners	Missing	Killed	Wounded
Great Britain	11,736	19,464	44,494	9,148	24,922	34,897
Germany .	38,963	142,960		24,163		
Italy . . .	4,531	14,293		Included in wounded		
Greece . .	Withheld as military secret				604	1,070
Russia . .	48,745	158,853				
Finland . .	15,000	40,000			640	

Unofficial estimates: France, 100,000 soldiers killed, 2,000,000 prisoners; Poland, 1,900,000 prisoners or missing. There are no reliable unofficial estimates for Belgium and The Netherlands.

leased several hundred British merchant seamen held on her as risoners. In France, Daladier was replaced in March by the more igorous Paul Reynaud as premier. For months the Germans had een rehearsing the invasion of Norway. On April 7–8 the British egan laying mines in Norwegian territorial waters to intercept erman ore ships. On April 9 Hitler's momentous decision was arried out, for on that day Germany overran Denmark and vaded Norway.

The Norwegian Campaign (*April 9–June 10, 1940*).—In the arly dawn of Tuesday, April 9, German columns moved across e Danish border and German warships appeared in Copenagen's harbour. There was little resistance and before noon the hole of Denmark was occupied, with the Danish king and govrnment accepting the inevitable. Simultaneously, German warhips appeared in the fjord leading to Oslo and German planes ew over the Norwegian capital. Norwegian shore batteries rested the attack, sinking the German cruiser "Karlsruhe" and amaging the 10,000-ton "Bluecher," which later was sunk by a ine. The royal family fled from Oslo, with the government, aving the capital to be occupied by the Germans during the day.

Almost simultaneously German forces appeared in and took ver Bergen, Trondhjem, Stavanger and Narvik. Apparently by ccident, German naval forces fell in with light British forces layg mines on the Norwegian coast. In Narvik fjord a fierce action as fought by a British destroyer flotilla seeking to dislodge the erman destroyers already in possession of the fjord. The Brith lost two destroyers, but claimed to have sunk one German deroyer and left three others helpless, to have destroyed six Geran merchantmen and an ammunition supply ship. The remaining ays of the week saw aeroplane raids by the British on German aval units and landing points, attacks on German transports, with everal reportedly lost and rumours of heavy naval actions in the kagerrak. The dominant note was one of surprise and confusion.

During this period, characterized by heavy snowstorms and bad eather over much of the battle area, it is now clear that even ondon and Berlin were not too accurately informed regarding e movements of their fighting forces. Berlin had the advantage, r the Germans were working on a most carefully planned schede, with an immense amount of prior preparation on the ground espionage, sabotage and treachery, notwithstanding their ansparent and generally disbelieved claim that they had only ted to forestall British action against Norway's neutrality.

As the first week ended, it became clear that every division ncentration area in Norway, except one in the far north, north Narvik, had been taken over by the Germans within the first o days. The small, ill-equipped Norwegian army never had a al chance to mobilize. Confusion of orders appeared everyhere. Norwegian officers surrendered without fighting; others, of questioned loyalty, received orders to cease resistance. Comunication facilities fell into German hands. The German forces d effected almost unopposed landings at all major ports and sered possession of all important airfields. Some troops were nded from merchant ships which had been lying in Norwegian rts for days. The German forces in the first week probably talled about 25,000 men, although they later exceeded 100,000. is doubtful if the Norwegians ever mobilized more than 30,000 en, two-thirds of whom were in the far north, whereas the rategically vital area of the country was in the south, with ither rail nor road communication between the two areas.

The Anglo-French Allies were able to land expeditionary forces the Norwegian coast, mainly at Andalsnes and Namsos, small rts south and north of Trondhjem in central Norway, and at d around Narvik in the far north. These forces did not land til the Germans had been established in Norway for a week. rom statements later made by Winston Churchill, then first lord of the admiralty, it appeared that these forces amounted to only some 12,000 men, about one-tenth the number of Germans they ultimately had to evict. They never succeeded in getting mechanized equipment and heavy artillery ashore; their anti-aircraft defence and land-based air force were nearly nonexistent.

After the first few days, British sea power proved unable to check the movement of men and supplies from Germany, while German air power was proving able to interfere drastically with the landing of Allied reinforcements in the Trondhjem area. After several attempts to penetrate Norway and link up Norwegian resistance, the Allied effort had to be abandoned and the troops withdrawn, except from Narvik. Following this withdrawal, May 5–8, the Germans remained in possession of all southern and central Norway. The force at Narvik eventually took that town early in June, only to be withdrawn two or three days later. This final withdrawal after victory was forced by the desperate need of men and of restricting operations arising from the Allied disasters in France, which put France out of the war a week after the final evacuation from Narvik.

Allied casualties in land fighting were not heavy, largely because the forces landed were small. Germany reported her death casualties in Norway as 1,300. It is not clear whether or not this included losses on transports sunk in the early operations. The British lost several destroyers and the aircraft carrier "Glorious." In the popular mind, the great issue of the Norwegian campaign was control of the iron ore coming through Narvik from the Swedish mines. While this was then the source of Germany's high-grade ore, shutting off the movement from Narvik would not have prevented the ore moving through the Baltic a few weeks later when the ice broke up. Yet the British official statements and troop dispositions indicated that the Allied strategy regarded Narvik as the important strategic area, leaving south and central Norway relatively unplanned for. The German concept was clearly quite different. Having captured the southern half of the country, they had secured themselves against the risk of an Allied base in Scandinavia from which to attack north Germany. They had obtained air bases nearer northern Britain. As the event turned out, they eventually took over all Norway, including what was left of Narvik and sole access to the ore mines, upon which the Allies also had previously been drawing.

Politically, the effects of the Norwegian campaign were immediately more important than in a military sense. The disaster brought suddenly to a head all the accumulating discontent in Britain with the ineptitude of the Chamberlain government, whose war actions had been characterized by the prime minister of the World War of 1914–18, David Lloyd George, "always too late or too little."

One of the most bitter debates in the history of the house of commons followed the first evacuations from Norway, although the members did not know that the evacuation was being carried out from Namsos as the debate opened. The government received a vote of 281 to the opposition's 200, compared with a normal majority of 414 out of a total membership of 615. The prime minister admitted that British intelligence services had given ample warning of the Norwegian invasion. His explanations did not satisfy the house or the country, for his nominal victory fell short of a majority. On Friday, May 10, Neville Chamberlain announced that he had resigned as prime minister and that the king had appointed Winston Churchill, first lord of the admiralty, to succeed him.

In Germany, Reichsfuehrer Hitler's last doubts were settled by his Norwegian success. All counsels of moderation were swept aside, for he had seen how pitifully unprepared the Allies were to meet his great war machine. While Neville Chamberlain was making his last desperate effort to save his government, Germany

struck again. In the early dawn of May 10 the German divisions and air forces poured over the Low Countries, the Netherlands and Belgium; and when Winston Churchill became prime minister that evening, the "total war," of which, unheeded, he had been warning his countrymen for so many years, had begun. Thus in the wake of one disaster and in the lurid advance glow of a greater one still to come, this man of aggressive energy, who had long enjoyed the intense hatred of the nazi leaders, took over the supreme responsibility for saving England from a greater peril than perhaps even he had ever visualized.

Destruction of the Low Countries.—*Invasion of the Netherlands and of Belgium; Battle of the Meuse (May 10–20, 1940).* Unlike Norway, both the Low Countries had been expecting, or at least fearing, invasion for months. Both were almost fully mobilized. The Netherlands and Belgium, after their abortive peace effort in November 1939, had consummated some arrangements looking to joint defence. Between them they had some 900,000 men, many of them indifferently armed and equipped. Their joint air force probably did not exceed 900 planes and was probably well short of that figure in modern combat machines. Great Britain had available the British expeditionary force, just south of the Belgian border with France, well equipped and trained. Together with the French armies immediately south of the Belgian frontier between Sedan and the sea, these troops aggregated perhaps 750,000 potential reinforcements for the Dutch and Belgian forces, in addition to a considerable but not definitely known air support. The entire available air force was, however, far short of what the Germans used.

At the time she invaded the Low Countries, Germany had a total of more than 200 divisions, say 3,500,000 men; between 4,500 and 6,000 planes, plus reserves, and this force included probably 12 *Panzerdivisionen* (armoured divisions), while the Allies had probably no more than 6 such divisions, not so well equipped. Germany probably allocated not less than 1,000,000 men, possibly 1,500,000 men (100 divisions) and approximately 3,000 planes for the invasion of the Low Countries.

The Netherlands relied for defence mainly on positions disposed on the lines of her "water defences" and on those defences which were essentially based on flooding certain areas in the path of the invading armies. Belgium had much more formidable defence lines. The Belgian line was reinforced by paralleling the Meuse river as far as Liége, and from there the Albert canal, a waterway with steep banks, making a formidable military obstacle. As a joint Netherland-Belgium defence line, this system had one glaring weakness—it did not link up the Albert canal or Belgian Meuse lines with the Dutch lines, and this gap was one of the main contributing causes to the speedy isolation of the Netherlands.

While the two invasions began simultaneously, that of the Netherlands was pushed to a victorious conclusion first. Two factors paralyzed much of the Netherlands scheme of defence—parachute troops, used with real effect and in large numbers for the first time, and secret agents and traitors, the so-called "fifth column" men. In Norway both had been tried out, the fifth column particularly with marked success, but the Netherlands showed them both in close co-ordination on a large scale.

The broad strategy of the German attack followed the well established lines of the so-called Schlieffen plan, designed by Alfred von Schlieffen, chief of the German general staff from 1891 to 1907. His plan called for a great German army, with its left flank holding the French along the fortified Rhine and Moselle frontiers, swinging an extremely powerful right flank through the Low Countries into northern France, over the flat coastal plain which borders Europe on the Baltic, along the shores of the North sea and the English channel.

This plain provides the easiest road of invasion into the he of France. The Schlieffen plan was carried out with weap and forces which its author could scarcely have imagined. So of these new weapons, particularly the plane used both for bom ing and for landing troops behind the enemy defences, permit modifications of the plan, which, however, merely accentua its basic concept.

The outstanding modification of the old tactics was the u as in Poland, of fast-moving, relatively small forces, penetrat deep into the enemy country with total disregard for the saf of their own lines of communication and supply. This ser the dual purpose of disorganizing the immediate rear areas a of preventing co-ordination of various elements of the ene forces. For example, it was instrumental in preventing the Al from sending much needed reinforcement to the Dutch.

In the Netherlands, the ground attacks proceeded from seve points, all converging toward The Hague, Amsterdam and Rot dam. The most powerful of these struck across Dutch Limb toward Maastricht. Its prompt success isolated a considera part of the Netherlands from any hope of reinforcement fr the south, for it was here that the gap existed between the B gian defence lines, which at Liége and just west of Maastri turned west along the line of the Albert canal and the Du water defence positions some 40 or 50 mi. further north. only other practicable method for bringing in Allied or Belg troops, other than by sea, to the Rotterdam area, was across long bridge over the Maas at Moerdijk. This bridge was seized the first day by German parachute troops and held tenaciou until the German ground forces finally pushed through.

In Rotterdam, Amsterdam and The Hague, these troops land from the air and picking up guidance at once from agents plan at their points of landing, did enormous damage to the Dutch sistance. Many of these agents were Germans who had ente the country years before as tradesmen, etc.; some were Germ naturalized as Netherlanders and some were just plain trai to their native land, men who had become imbued with the n ideas. Intense air bombing was poured on all places offering slightest resistance. Broken, overwhelmed, the Dutch did o strong resistance and suffered heavily, but on May 14, realiz the hopelessness of their position, General Henri Gerard Win man, their commander-in-chief, surrendered the armies north east of the Scheldt, virtually all the Netherlands. The queen the government had previously made their escape to Engla whence the Netherlands government continued.

Meanwhile, within two hours after the German invasion had gun on May 10, British and French troops left their prepa positions in northern France and hurried north across Belgium meet the enemy. The French IX army moved north from general vicinity of Sedan, which marked the end of the Mag line proper. Apparently, the French were relying on the r flank of the IX army being covered by the Ardennes, suppos held by the Chasseurs Ardennais, regarded as one of the divisions in the Belgian army. Just what did happen in the dennes is not clear, but a powerful German thrust came thro at this point.

The German army which struck at Maastricht had crossed Albert canal on the first day, under conditions which stron suggested treachery. The Germans had similarly forced their beyond the Liége forts and the force pouring out from the dennes now defeated the French IX army by falling on its expo flank while it was moving up to position, and forced the pass of the Meuse. The battle of the Meuse was over, the Bel Meuse-Albert canal line penetrated and turned, and the Germ were in France itself and through the Maginot line extension west of Sedan by May 13–14.

Battle of Flanders, or of the Channel Ports (May 21–June 3, 940).—Following their now familiar tactics, German mechanized nd motorized troops were hurried through the first gap and anned out in the rear of the broken position at Sedan. Each urther penetration behind the first one, each spreading of the orces moving in through the first break, once more demonstrated he age-old weakness of a fixed position, namely, that it either olds entirely or fails entirely. The odds are against a partial ailure of a fortified line remaining only partial.

Actually, the Maginot line had not been "broken." The penetrion had been made through the relatively weak extension of the Maginot line along the Belgian frontier. It had been made when, ue to a strategic miscalculation, even that weaker section had een left badly undermanned. Nonetheless, the area which the Maginot line was meant to protect from invasion had been penerated, and that operation alone made possible the succeeding noves which forced evacuation of the entire Maginot line itself.

On May 21, some of the German fast-moving units, having urned in a general westerly direction after penetrating the 'rench defence lines at Sedan, crossed the Oise and entered the alley of the Somme, down which they raced to its mouth at bbeville. By all previous standards of war, it was a mad enterrise, for they had carried a long narrow salient, very thinly eld, if held at all, some 150mi. west from their main forces, ith the entire Belgian army, most of the British expeditionary orce and at least two French armies, nearly 1,000,000 men in all, o their north, while the main French army lay behind and to ne south of them.

Without pause, more troops were poured through the break. irst came the heavy armoured divisions, closely followed by the ghter motorized troops and finally the heavy masses of infantry, ne last named, far behind. Before and after and all around the ar-advanced spearheads of mechanized and motorized troops warmed their air force, principally dive bombers and parachute roops. Every possible rallying point, every traffic centre where llied troops could be mobilized to strike counterblows was ombed, fired or occupied. Allied troops were mercilessly hared by this new flying artillery of the air.

Another new technique of this "total war" appeared. German ir force units systematically terrorized the country well behind ne fighting fronts. Streams of civilian refugees were bombed and nachine gunned. Parachute troops fired small towns and villages nd drove the population from their homes. This was not merely anton cruelty or destructiveness, it soon developed. These huge ordes of panic-stricken refugees began to do what the Germans ad not sufficient force to do directly—they clogged all the roads hich were essential to movement of Allied military transport ehind the fighting fronts.

The British expeditionary force first met the enemy in the icinity of Louvain and Malines. After holding Louvain, being riven from it and retaking it, the British were compelled to fall ack again as the German blows to the south across the Meuse nd across the Sambre (held by the French), made the Dyle line Louvain-Malines) untenable. Brussels and Antwerp fell in quick uccession.

With the fall of Antwerp, the Belgian army was subject to the nost severe pressure by a greatly superior enemy force. If, uner that pressure, it was driven in and away from the coast, the ntire Allied army in Belgium might be caught in a double enelopment, of which the southern wing coming up from Abbéville night meet the northern wing coming down from Antwerp and ut the Allies off from the sea and from the main French army.

The abandonment of Belgian cities west of Brussels, in any ase, was being made almost unavoidable by German victories in outhern Belgium and the spread of German troops across northern France. In the menace of being cut off from the main French army was possibly the weak point of the German position; namely, that they might not yet have pushed sufficient troops through to hold that long narrow salient down the Somme valley. If that salient could be cut, not the Allied armies, but the daring German mechanized troops, the striking force of the German armies, might be cut off. A strong offensive was consequently launched from north of the Scarpe toward Cambrai and Bapaume. The French had massed seven divisions between Amiens and Péronne to strike north to meet the Allied force striking south, hoping between them to close the neck of the salient and trap the German *Panzer* troops.

These decisions were taken on the afternoon of May 23. Four days before, May 19, General Maxime Weygand was peremptorily called home from the near east and placed in command of all the Allied armies, replacing General Gamelin. The disciples of the power of the defence, of whom General Gamelin was outstanding, stood thoroughly discredited by the Allied disasters.

Weygand almost immediately removed 15 generals from important commands in the French army and replaced them with men more in sympathy with aggressive ideas. Among them was Colonel de Gaulle, who was raised to general rank, and who later refused to accept the French surrender.

In England, an Emergency Powers bill was rushed through parliament, conferring on the government virtually dictatorial powers over all persons and property. It was evident that the German advance to the English channel at Abbeville had not only imperilled the British army, it had also suddenly brought the invasion of Britain into the realm of the almost probable, as it had not been since Napoleon's day.

German air superiority was now turning the scale. Even before their ground forces occupied or beleaguered the channel ports, which had become the sole route for supplying approximately 750,000 Allied troops—the British expeditionary force, the remnants of three French armies, the I, VII and IX, the Belgian army and some remnants of the Dutch army—German planes had been heavily bombing those ports.

In addition to the tremendous problem of supplying so many troops, engaged in ceaseless combat of the utmost intensity, millions of civilian refugees had also been caught in the ever shrinking pocket, for the German pressure was now coming from the north, the east and the south.

The French army to the south was not in a position to assume the risks of striking a major blow north toward the entrapped Allied forces in Flanders. The same circumstance gave little basis for the temporary high hopes of the only other possibility of

RUINS OF ELVERUM, Norway, after its occupation by German troops April 20, 1940

SUPPOSEDLY IMPASSABLE road barriers in Belgium did little to retard German mechanized divisions in the week of May 10-17, 1940

breaking the trap—a general French counterattack down the valley of the Meuse from the vicinity of Montmédy-Rethel. Such a move, if successful, could have cut the lines of communication and supply of the entire German force in Belgium. The mere concentration of the forces necessary for such a stroke presented gigantic problems of transport and supply under most adverse conditions and involved taking grave risks by withdrawing troops from the Maginot line and the Italian frontier. The dynamic new Allied commander, General Weygand, almost accomplished the impossible, but at that moment, in the early morning of May 28, 1940, King Leopold of the Belgians surrendered his army.

This action gave rise to bitter controversy. The heads of both the British and the French governments indicated that the Belgian king's action was taken without notice to the British and French commanders. While this may have been true of his actual decision, it was certainly known to General Weygand, and to others, that Leopold was contemplating such action two days before he acted. It may be long before the full story of Leopold's surrender and its motivating causes is known, but the military consequences were immediate and clear.

The battle of Flanders, or of the Channel ports, was that morning irretrievably lost by the Allies. The Belgian army had been holding the northern arm of the rough crescent centring around Dunkirk and swinging over southwestern Belgium and northwestern France. The Belgian surrender imperilled the last avenue of evacuation. There was no time left now for a French major counterattack to be developed (within the day, the Germans began moving divisions toward Rethel whence any major French effort must come). No possibility remained of the Allied forces in Flanders rejoining the main French armies south of the Somme. Only evacuation by sea was left, and that was a desperate, an almost hopeless-appearing expedient.

No purely military study of the major aspects of the war could do justice to the skill and the heroism of the evacuation from Dunkirk. Suffice it to say only that, when it began, members of the British imperial general staff doubted that 25% of the B.E.F. could be saved. When it was completed, some 330,000 French and British troops, together with some Belgian and Dutch forces who refused to surrender, had reached haven in England.

Roughly, this represented three-quarters or more of the Allied effectives left in Flanders after the Belgian army had surrendered. The evacuation was carried out under intense German air b bardment and while brilliant rear guard actions were holding the ceaseless attacks of vastly superior numbers of German tro of all arms. One of the most motley fleets of history—sh transports, merchantmen, fishing boats, pleasure craft—took n off from the very few ports left, from the open beaches th selves, for German air attacks had virtually destroyed most facilities.

The royal air force, including planes from the metropol force in England, met and asserted at least temporary superiority over the tremendous German air forces, and the r navy, with daring and precision, assisted by courageous Fre naval craft, stood close in shore and not only covered the eva tion, but took off thousands of men in overloaded destroyers other small craft. The men were saved in large measure, but most all their heavy equipment, tanks, artillery, motor trans and considerable stores had to be abandoned.

The Germans officially placed their own losses from May 1 June 5 at 10,252 killed, 42,523 wounded and 9,463 missing. Pr Minister Churchill admitted losses of more than 30,000 ki and wounded and of nearly 1,000 guns. The Germans clai 80,000 prisoners taken at Dunkirk alone. Some days later, Gen Charles de Gaulle, French general in London, estimated t Allied losses at about 65,000 killed and 950,000 missing prisoners. These figures obviously included the surrende Netherlands and Belgian armies.

The French had lost, as battle units, at least three Fre armies and almost the entire British expeditionary force. T had lost completely the fortified line on the Franco-Belgian der and they now faced an enemy in great force on the soi France, with its powerful right actually behind the main Mag line positions, while the defence of Paris and of all south central France rested on an improvised defence line along Somme and Aisne valleys.

The western section of the front, along the Somme, was haps the strongest section of the French front, due primaril the ten reserve divisions. Yet it was against this sector that German attack was launched.

Battle of France (*June 5–25, 1940*).—At 4:00 A.M., Wed day, June 5, 1940 (nine minutes after sunrise) the Ger artillery opened fire, tanks and infantry moved forward planes took the air in the last attack on France; the battle be which was at once named by Weygand, the Battle of Fra

Utilizing every day gained by the heroic defence of the trapped mies in Flanders, General Weygand had established a new line defence. Hinging on the Maginot line at Montmédy, the new rench line ran roughly north of Stenay on the Meuse, thence uthwestward to Attigny on the Aisne. From there the line fol-wed the course of the Aisne past Rethel and Neufchâtel to the cinity of Vailly. Swinging northward to the Oise-Aisne canal, e line crossed the Oise, probably near Chauny and struck the mme at or near Hom and ran down the Somme valley west-ard to the sea at Abbeville.

Results of the German attack over the Somme strongly indi-ted a failure on the part of the Allies to take advantage of the ne, so dearly bought by the entrapped armies in Flanders, to epare the ground for defence. It is fair to the French high mmand at this stage, however, to note that some of the troops d not arrive from other areas until the eve of the battle, while ny that were available were used in the vain effort to close the ronne-Bapaume gap, or to wipe out bridgeheads the Germans d established on the south bank of the Somme. These excuses d little validity further east and the conclusion is inescapable t the French armies of 1940 fell far short of those of 1914–18 tenacity and fighting spirit and leadership.

It was soon evident that the immediate German objective was t the taking of Paris, but a continuation of their effort to stroy the remaining French armies in the field. The defenders re now essentially a French rather than an Allied force. The rman attack opened up along the front from Laon to the sea, th the usual barrage of dive bombers and powerful thrust of chanized troops. For a short time, the French appeared to be lding on the Somme, but the powerful German mechanized rusts, hurled back at many places, at last found weak points for eir infiltration and the deadly routine of Poland and Flanders s repeated. By June 8, they had forced the passage of the sne and Roye on the Avre and Noyon on the Oise had been errun. A general retirement now was carried out by the French, m the sea as far east as the Chemin-des-Dames.

In the air, the Germans were meeting an air force which, while lied, was increasingly British in composition. The British royal force was taking a big share in the battle, both over the rman armies and far in their rear, bombing communications d concentration points.

On June 10, 1940 Italy entered the war on Germany's side but r active participation made little difference. Meantime, the rman threat to Rouen had developed, the Seine had been ssed and the forces moving down from the Aisne and the Oise re coming closer to Paris. No military gain seemed likely by fending the city, the government having already gone to Tours, d on June 14, Paris was evacuated by the French army, now ving south to set up a new defence on the Loire. Between the te of Italy's declaration of war and the fall of Paris, the first idences of the disintegration of the French armies began to pear. It has since been stated in an editorial in the semi-official d usually well informed *Temps* that on June 12, General Wey-nd demanded that the government seek an armistice.

About that time the Germans claimed 100,000 French prisoners d been taken since June 5. It was at this time also that the rman advance widened its front east of Laon, moving across e Aisne near Rethel and taking Reims and Châlons-sur-Marne. The day after the nazis entered Paris, the fall of Verdun placed e German armies well in the rear of the main Maginot line. e troops garrisoning the line were likely to be trapped without ssibility of serving a useful military purpose. Actually, evacua-n of the Maginot line appears to have begun immediately llowing the fall of Verdun.

The French government had moved from Tours to Bordeaux, since Tours was now on the new defence line on the Loire. Early in the last week but one of the fighting, Premier Reynaud issued a stirring appeal to all France and her allies and friends, proclaiming his intention to maintain the battle even if pushed back to French North Africa. On the day Paris fell, the day the government fled from Tours to Bordeaux, he issued another appeal, but the note of confidence was gone. He now said: "Today the life of France is at stake. . . . Our fight, each day more painful, has no further sense if in continuing we do not see even far away the hope of a common victory growing." On Sunday, June 16, the Bordeaux radio announced that Reynaud had resigned as premier and had been succeeded by Marshal Henri Philippe Pétain, the victor of Verdun in the World War of 1914–18, the author of the rallying call *Ils ne passeront pas.*

Although the cabinet included General Weygand as minister of defence, the presence of noted pro-fascists, appeasers and pacifists, such as Pierre Laval as minister of justice, and the disappearance of uncompromising bitter-enders, such as Reynaud and Georges Mandel, Reynaud's minister of the colonies, left little doubt that this government had been formed to bring the war to an end. On June 17, the 84-year-old Marshal Pétain, "with a broken heart," asked for honourable terms of armistice.

There were delays, for the Germans were now in no hurry, but on June 21, 1940 the German terms were presented in the presence of Adolf Hitler to the French delegates, in the same railway car at Compiègne where the armistice of Nov. 11, 1918, ending the World War, had been signed. The following day the French accepted the harsh terms of surrender (see *Franco-German and Franco-Italian Armistices,* for terms), but they were required to negotiate separate terms of armistice with the Italians before the German armistice became effective. This was done on June 24,

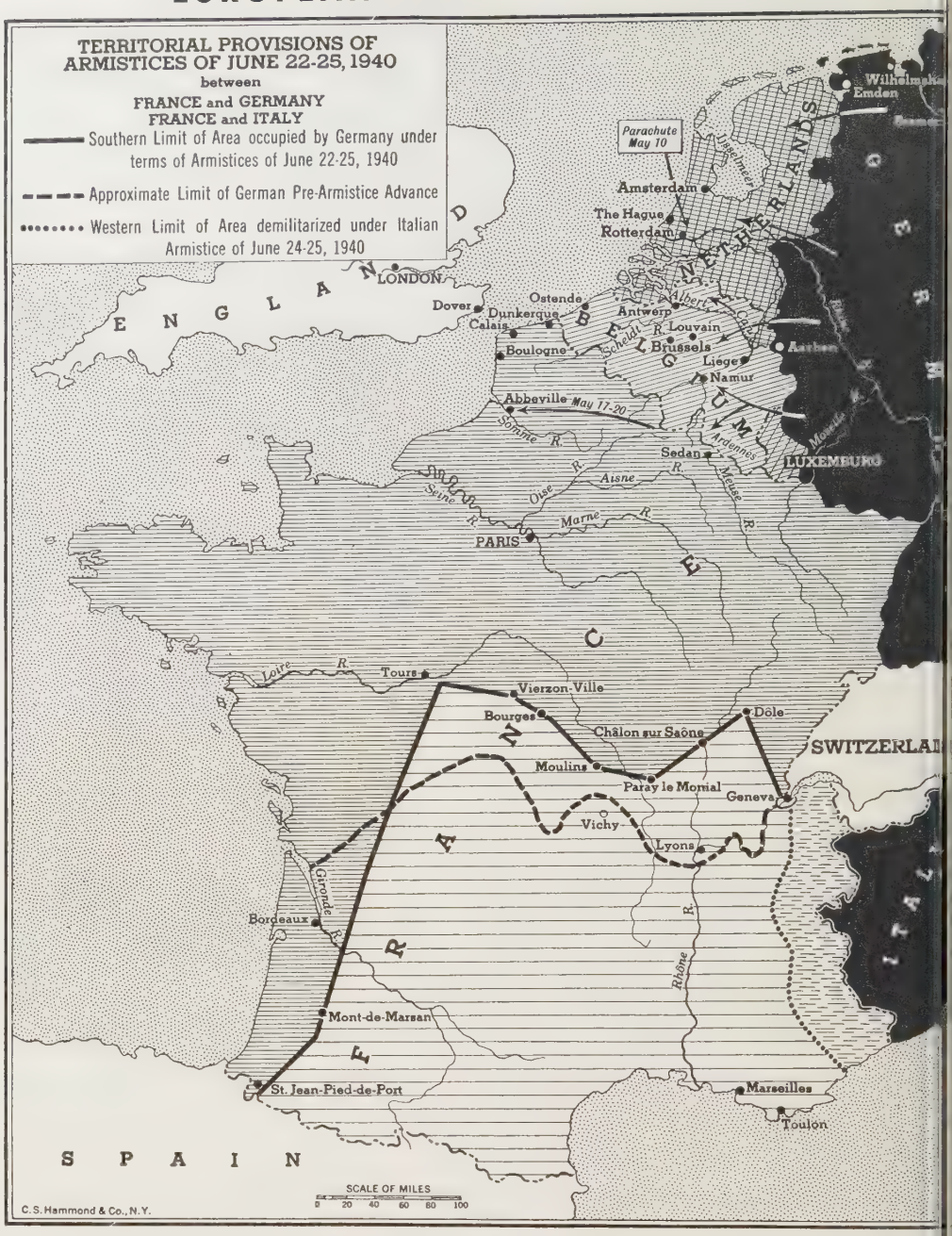
GERMAN PARACHUTE TROOPS descending on a Flanders field in May 1940

1940 in the Villa Incisa, about 12 mi. from Rome. The news was flashed to Berlin and six hours later, at 12:35 A.M. French time, June 25, 1940 hostilities between France on the one hand and Germany and Italy on the other, were ended.

During the last week, from Marshal Pétain's request for an armistice on June 17 to the end of fighting on June 25, fighting continued. The Germans penetrated the Rhone valley as far as Lyons, which was retaken by the French, only once again to be seized by the Germans, but evacuated under the armistice terms.

As was inevitable, the French surrender led to bitter recrimination and eventually virtual war with their British allies. Mr. Churchill, the British prime minister, bitterly denounced the surrender of the Pétain government. Insofar as that government had surrendered the French fleet into virtual German and Italian control, the reproach seems to have had some justification.

On the other hand, the French had made a gallant fight. Their later attempts to blame their defeat on inadequate British aid had slender foundation, except that they blamed their allies for being in the same sorry state of unpreparedness that they were themselves. If there was no British expeditionary force at the end, it was largely because it had been destroyed as the consequence of blundering by the French high command at the Battle of the Meuse and in permitting the break through at Sedan on May 13–14.



That the French fought valiantly remains to their eternal credit. German official casualty lists give eloquent testimony as to the quality of French resistance, however belated and inadequate were their preparations for defence. The German losses in the 20 days of the Battle of France, right up to June 25, were in killed and wounded, 60% larger than in the 26 days from the invasion of the Low Countries to the fall of Dunkirk. German losses were stated in German official summaries as 16,822 killed, 68,511 wounded and 8,921 missing. Exact French losses are not yet known, except for the German claim of 1,900,000, which includes the total French armies surrendered as prisoners.

Franco-German and Franco-Italian Armistices. (*June 22 and 24, 1940*).—The terms of these two armistice agreements, being in effect complementary parts of one armistice, were very similar in all but territorial provisions. The German consisted of 24 articles and an appendix and the Italian of 26 articles.

Article I provided for the cessation of all hostilities in all parts of the French republic and colonial empire. Article provided for occupation of certain specified French territory German and Italian troops. German troops occupied roughly the area of France, including considerable sections from Na south to the Spanish border, along the Bay of Biscay, sect which they had not entered when the armistice was signed. Germans occupied the entire west coast of France from Spanish border to Belgium and all France north of a line run from the Swiss frontier near Geneva through Dole, Châlons-Saône, Moulins, Vierzon, to 20km. east of Tours and th southerly to St. Jean-Pied-de-Port on the Spanish border.

In contrast, Italian troops occupied only the slight areas had actually conquered, while the French agreed to demilita an area 50km. wide west of the line of the Italian furthest vance, which was to say, 50km. west of the Franco-Italian bo for the most part. In addition, Toulon was to be demilitar On July 5 this provision was modified, following the succe British attacks on French naval units to prevent them passing der German and Italian control as provided in articles VIII (man) and IX and XII (Italian).

Article II (Italian) provided further for demilitarization of ertain colonial areas in French North and East Africa. Articles II to VII, inclusive (German), and IV to XI (Italian) covered dministrative provisions for demilitarization and demobiliza- on procedure and for control of occupied territories.

Article VI (Italian) specifically called for demilitarization ithin 15 days of French "fortified areas and naval bases of oulon, Bizerte, Ajaccio and Oran." No corresponding provision the armistice with Germany was necessary, since Germany was actual possession of all other French naval bases. Articles III (German) and XII (Italian) called for concentration and emobilization and disarmament at French ports of all French aval vessels. These provisions were the root of a bitter clash be- ween the erstwhile Allied governments, which culminated in the ritish naval attack on the French ships at Oran on July 3. (See *he War at Sea.*) On July 5 Germany and Italy agreed to odification of the naval articles, so as to enable French re- stance to the British. Although not so regarded at the time, the light of subsequent events, this was the first tacit admis- on by the axis powers, particularly Italy, that, notwithstanding ll their boasting, the Italian fleet alone could not control the Mediterranean against the British.

The remaining articles of both armistice agreements provided r a great number of detailed arrangements subjecting France fectively to enemy control of her trade, communications, mer- hant shipping and specifically forbidding any form of assistance Britain for the remainder of the war. French prisoners of ar were to remain prisoners, but German and Italian troops ken prisoner were to be released forthwith.

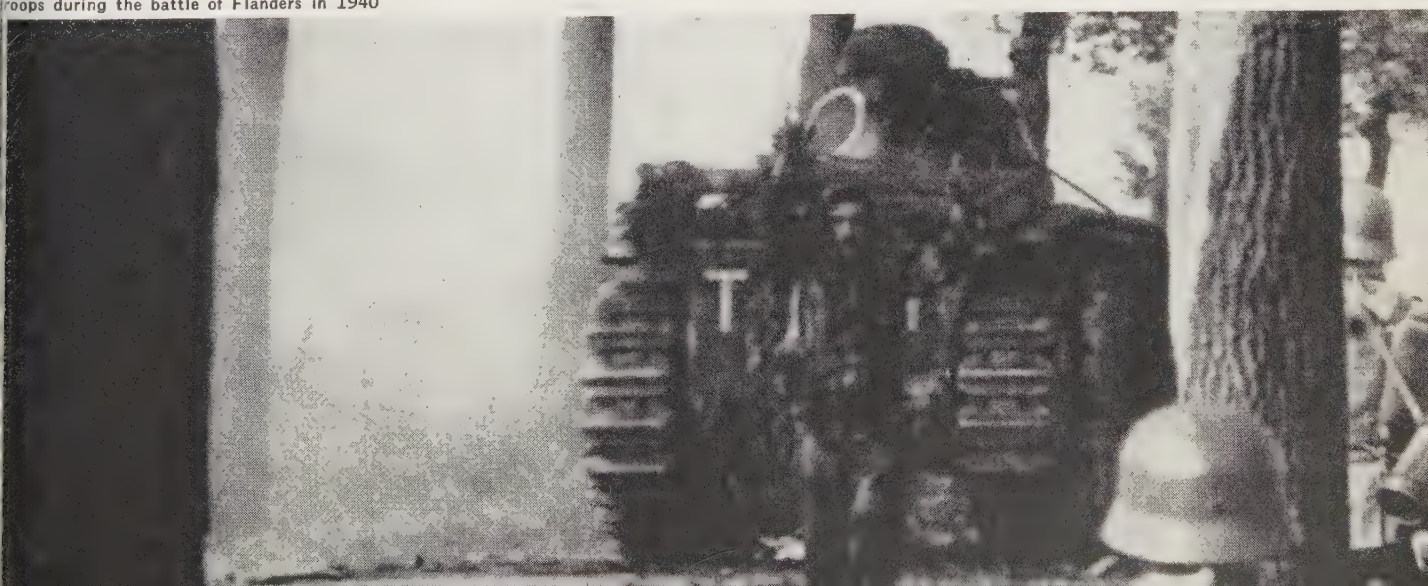
Article XVIII of the German armistice obligated the French overnment to bear all the costs of the German occupation. ther clauses obligated France to maintain in good order all roperty to be delivered to Germany and to furnish all labour ecessary to restore damaged harbours, docks, rail and other acilities to be delivered to the Germans (article XIII). Article IX, dealing with prisoners of war, contained a provision that The French government is obliged to surrender upon demand all ermans named by the German government," obviously aimed t securing possession of the persons of refugee German exiles rom the rigours and persecutions of the nazi regime.

Results of the French Surrender. *(a) At Home.*—The obvi- us intent and immediate effect of these two agreements was to educe France to utter subjection, primarily to Germany. Italy on turned out to be too weak to enforce any claim that even rench colonial governments chose to stand firmly against. How ar this subjection to Germany went, was evident within two weeks, when the French national assembly (about two-thirds of the members being present), under the guidance of Pierre Laval, authorized a new constitution for France, abolishing the republic and substituting a totalitarian regime; substituting the slogan, "For labour, family and country," for the old revolutionary watchwords of democratic France, "Liberté, égalité, fraternité." In the course of the next few weeks this same Laval emerged as the dominant figure of the chief of state's (Marshal Pétain's) cabinet, becoming vice-premier in succession to General Weygand. Eagerly courting the conquerors' every demand, he eventually overreached himself and was abruptly dismissed by the old marshal in Dec. 1940, thereby precipitating a crisis in relations between Marshal Pétain's government and Hitler's reich as the year ended.

(b) In the French Colonial Empire.—France's surrender precipitated various developments throughout her world-wide colonial empire. For a time there was considerable doubt as to whether the colonial governments would concur in the surrender. Eventually most of them did. This decision in Algeria and French North Africa precipitated the British naval action at Oran on July 3. In Syria, the administration gave such grudging accession to the terms of the armistice that an Italian mission lodged forceful complaint at the number of French and Polish troops who were being allowed to desert and cross the borders into British Palestine or Turkey. As 1940 came to an end, considerable uncertainty existed as to just how far actual demobilization of the French forces in North Africa and Syria had proceeded. There was a general impression that the strength of these forces remained much what it had been at the moment of the June armistice and that only those elements of the famous Foreign Legion actually in France had been affected by the terms of surrender. In French West Africa, after one abortive attempt at Dakar, there was considerable sympathy for the cause represented by General de Gaulle, who, scorning the armistice, had fled to England and set himself up as the leader of "free Frenchmen." Shortly after the Dakar setback, de Gaulle was welcomed in the Cameroons and won over French Equatorial Africa. Subsequently, General Weygand left the Pétain government at Vichy, France, and proceeded to Algeria and Tunis, with the announced mission of holding North Africa in line. It was understood that he was loyal to the marshal, but not bound to any successor, such as the ambitious Laval might have been. After the latter's fall, as 1940 closed, the resultant rumours of strained relations between Vichy and Berlin gave rise to speculation that Weygand, if Pétain was overthrown, might resume the war in North Africa.

(c) In the Americas.—While the armistices were being negotiated, the U.S. government had notified all interested European

NLY SURVIVING MEMBER of a French tank crew surrendering to German roops during the battle of Flanders in 1940



THE CROWNING TRIUMPH of human ingenuity as envisaged by Herblock of NEA Service

powers that no transfers of European colonies in the American hemisphere to non-American nations would be recognized by Washington under the Monroe Doctrine. On July 1, the German foreign minister made an ambiguous reply, denying Germany had any intention of acquiring French, Dutch or other European colonies in the western hemisphere, but making observations plainly indicating willingness to accept the United States interpretation of the Monroe Doctrine. The U.S. secretary of state reiterated his previous warning at a press conference on July 5. The question was left open of the status of those European colonies with nominal sovereignty unchanged, but with the home governments, as were the French, apparently accepting German domination. The Dutch colonies still owed allegiance to their queen in exile, and the Belgian Congo in Africa to its government in exile, so that the question of German domination of them did not yet arise. In the French West Indies, certain French warcraft and a number of aeroplanes purchased from the United States, took refuge. Coincidental with the British naval attack at Oran, British warships took up a patrol off the French West Indies, presumably to prevent the French craft proceeding to Europe under the armistice terms. After some weeks of tension, a *modus vivendi* was worked out and ships of the American neutrality patrol apparently took the place of the British vessels. America released some of the sequestered French credits in the United States to purchase needed foodstuffs and supplies for the French West Indies. Perhaps it was significant that this easing of tension coincided with rumours of cooling relations between Vichy and the German conquerors, but as 1940 ended, the significance, if any, was hidden in the future.

(*d*) *In the Far East.*—France's fall was promptly seized upon by Japan as an opportunity to serve demands that she stop all traffic from French Indo-China to the Chinese government of Chiang Kai-shek at Chungking and submit to Japanese inspection of her railroads. These demands were accepted without serious demur, to be followed by other encroachments. Some were resisted, but to small avail, and the end of 1940 saw Japanese troo established on French Indo-China's soil, while Thailand (Sian (suspectedly under Japanese instigation) was attempting inv sions and creating incidents on the opposite frontier. Japan b gan a large-scale withdrawal from south China and many sig pointed to an intention to take over all Indo-China, prelimina to an attempt on Singapore. The entrance of Japan into acti partnership in the Rome-Berlin axis on Sept. 27, 1940, strengt ened these impressions. The Japanese move into the axis was a swered the following week by Britain announcing reopening the Burma road to supplies for Chiang Kai-shek and by t United States warning its nationals in the far eastern territori under the shadow of Japanese aggression to come home. The countermoves had a disconcerting effect on the Japanese, who ev dently had not expected such strong reactions and the far easter western Pacific situation between Japan, Great Britain and t United States remained *in statu quo* at the end of 1940, marke however, by almost unrelieved and officially admitted strain relations between Japan and the western nations.

(*e*) *In Europe.*—Within the week in which France surrendere soviet Russia promptly demanded and secured from Rumania t surrender of Bessarabia and of northern Bukovina, acting appa ently under the dual motive of protecting her frontiers furth from the growing power of Germany and taking advantage of t now obvious worthlessness of the former Anglo-French guarant of Rumanian integrity. King Carol II of Rumania threw himse into the protecting arms of Adolf Hitler. Within a few weeks

GERMAN BLOCKADE OF GREAT BRITAIN 1940–41

ıd lost most of Transylvania to Hungary and of the Dobruja to ulgaria and had been forced to abdicate in favour of his son, ıichael. Carol fled into exile, accompanied by Magda Lupescu, aving behind him a kingdom in anarchy and overrun with Ger- an troops. Spain naturally came under powerful axis pressure ith German troops on her Pyrenees border, but after weeks of tense diplomatic struggle, still stood neutral as 1940 closed. he Spanish caudillo, Franco, was aided in resisting axis pressure ıth inside and outside Spain by the Italian defeats in Greece, lbania and North Africa by the Greeks and British; by the con- nued resistance of the British (although their collapse within vo weeks had been a major premise of the June armistice negoti- ions), and by British open economic help in meeting Spain's oblems hanging over from her own civil war and the effect the blockades on her trade. It was suggested in some quarters ıat intimations that Spanish yielding to the axis might involve least tacit U.S. economic displeasure may have strengthened e anti-axis group in the Spanish government.

(*f*) *Changes in the Blockade Dispositions.*—The terms of the mistices changed the basis of the blockade plan. German occu- ıtion of all western Europe to the Spanish border, with Spain mpathetic, made it necessary to extend the British blockade to e entire continent of Europe and the British fleet had alone to ıoulder the whole task of blockade and convoy. It was now rtain that no food shortage would become operative in Ger- any, unless the war was prolonged into the spring of 1941, and ıubtful even then. The German situation was improved in other spects as well. Direct control of Luxembourg and Lorraine, cess to Sweden and direct contact with Spain solved all prob- ms of iron ore supplies, much as to copper, quicksilver and other inerals, placed by the German victories beyond reach of sea ockade. Oil remained little changed, except that all of Ru- ania's supplies were available to the reich and none to Britain, ıt these were never deemed sufficient for Germany alone, to say ıthing of Italy. Russia's supplies remained both unknown in uantity and enigmatic in availability. All this did not make the ritish blockade futile. For one thing, there were still some sential supplies not adequately provided for. For another, many f those supplies which were available customarily moved by a-borne carriage and the British blockade forced them to move y rail and inland canal over a traffic system not equipped to ındle such volume. The R.A.F. devoted considerable energy, ith success, to damaging this inland transport system.

There had always been two blockades, the Allied blockade, now the British blockade of Germany and the German, now the axis blockade of Britain. German victories helped the latter.

With all the ports from the Spanish shore of the Bay of Biscay to the North cape in their hands, the German submarine operation problem was immensely simplified and that of the British equally complicated. No longer, as in the war of 1914–18, could the German submarines be shut out of the Strait of Dover and largely excluded from the English channel and the waters south of the British isles. Moreover, Irish ports, available to the British convoy guards in 1914, were not available in 1940 by reason of Irish neutrality. The problem was becoming acute between Eire and Great Britain as 1940 closed. New bases in France and the Low Countries aided the German air force very effectively in the blockade of Britain in the closing months of 1940.

British shipping losses mounted rapidly. German claims on this subject were apparently exaggerated when they put these losses from June 25 to the year's end at 3,900,000 tons of merchant shipping, about 625,000 tons monthly. Competent neutral authorities placed the total losses of British, Allied and neutral shipping for the entire 16 months since Sept. 1939 at approximately 4,200,000 tons and estimated that the average monthly loss in the later months of 1940 ran about 325,000 tons. It was admitted that some 200,000 tons were lost in one disastrous week, but at the end of December a single week's loss had also fallen to some 40,000 tons.

In the Pacific, Japan's increasing hostility culminated in reports of 14 commerce raiders fitted out under the German flag in Japanese ports. Shipping losses certainly mounted in the Pacific and Indian oceans. The shift of Japan from an ally in 1914–18 to a nearly open enemy added heavily to British naval problems and also held some promise of complications with the United States in 1941.

The War at Sea *(April 9 to July 3).*—Throughout this period the Allied (after June 25, the British) blockade of German territory continued. After Italy entered the war on June 10, this blockade was also applied in full rigour to Italy and Italian shipping and colonies, but with the handicap, after two weeks, of not being able to use French naval bases.

Prior to the French surrender, the principal naval actions arose out of the German invasions of Norway and of the Low Countries and France. In the sea fighting connected with the Norwegian campaign the British losses included 4 destroyers, 1 tanker, 1 aircraft carrier ("Glorious"), while the French lost 1 destroyer and the Norwegians lost 2 gunboats. German losses included 1

SCAPING from the Flanders trap in the last days of May 1940, thousands of ritish troops waded into the sea near Dunkirk to board all types of ships wait- g to evacuate them to England

INTERIOR OF THE COMPIEGNE DINING CAR during the Franco-German armistice negotiations of June 21-22, 1940. German officers are to the left, French officers to the right

tanker, at least 1 transport, 2 cruisers, 6 destroyers, 6 merchant ships, 1 supply ship and heavy damage to the battleship "Scharnhorst," involving possibly her ultimate destruction while in dry dock undergoing repairs. Proportionately to their total strength, the German losses were the heaviest among the principal belligerents. In the early part of the operations the Allied fleets seemed to be in control, but ultimately the German air force proved able to prevent the Allied naval forces from cutting off the German troops in Norway from Germany. That superiority, however, did not extend very far off shore.

The next important act in the sea war accompanied the invasion of the Low Countries and France and is still shrouded in considerable uncertainty as to vessels engaged, losses and similar matters. Broadly, it was begun by the Germans with the movement of some relatively small forces down the Dutch coast. Allied landing parties, apparently predominantly British, did considerable destruction to Dutch and later to Belgian and French ports about to be, or actually, seized by the Germans, blocking channels by sinking vessels, destroying docking facilities and similar activities.

The outstanding naval exploit of this phase of the war was the evacuation of the Allied forces from Dunkirk. In co-operation with the air force, apparently again predominantly British, the Allied fleets covered this extraordinarily difficult evacuation. With their guns they helped maintain artillery protection for the retreating forces and assisted in holding off German occupation of the shore. They put up a tremendous anti-aircraft barrage to assist the air force. Both British and French ships were lost, principally destroyers and other light craft. Fortunately foggy weather on several days helped restrict the German air attacks. During the evacuation 220 light warships and 650 other vessels were used, the vast majority being British.

Battle of Oran (July 3).—By tragic irony, the greatest naval action of the war up to the end of 1940 was fought between the former French and British allies. Under the armistices with Germany and Italy, the French engaged to take their fleet into French ports and disarm their ships under German and Italian control. Great Britain regarded this move as adding the powerful French fleet to the Italo-German strength to make a force possibly equal to the British.

The British government had agreed with the Reynaud government, just before the surrender, to release France from her obligations as an ally in order to seek an armistice, provided the entire French fleet was placed under effective British control and not surrendered to the enemy. The British held that the Pétain government's acceptance of these conditions of the armistices v an act of treachery, and they gave no weight at all (qu naturally) to the solemn assurances of Germany and Italy t they did not "intend" to use the French fleet, so placed under th control in the war, *i.e.*, against Britain.

Much doubt remained for some days as to whether the Fren naval officers and the French colonial governments would acc the armistice terms arranged by the Pétain government, but wh it became evident that the governors in French North Africa a Syria at least would do so, the British acted swiftly. They to over all French naval vessels in British ports, made agreem with those in Alexandria, Egypt, to accept internment and militarization for the duration of the war and summoned Admi Marcel-Bruno Gensoul at Oran, Algeria, to do the same, or join them against the "common enemy," or to proceed to W Indian ports, there to remain interned.

The French admiral refused all these alternatives and in late afternoon of July 3, a British squadron under Vice-Admi Somerville opened fire on the French. Vice-Admiral Somerv later reported he had sunk the battleship "Bretagne" and damaged and driven ashore the battleships "Provence" a "Dunkerque," the destroyer "Mogador" and the seaplane ten "Comandant Teste" (the French later stated this last ship was at Oran). The battleship "Strasbourg" escaped with five li cruisers, but planes of the fleet air arm pursued and stru "Strasbourg." French and British accounts of the resultant da age differed materially, although it was agreed that she and cruisers did reach Toulon.

As a result of these various British actions, out of sev French capital ships, only "Strasbourg" remained afloat and un French control. Of four battleships building, two on the w may have been seized by the Germans, far from completed, a these may have been damaged. Of two nearly complet "Richelieu" was probably incapacitated by a daring attack Dakar, while "Jean Bart" was virtually demilitarized in the h bour of Casablanca. Possibly two-thirds of French destroye submarines and cruisers remained under French control. It v notable that this most drastic British naval action had tai place in the Mediterranean without Italian interference.

One week after Oran, on July 10, the British apparently sou out the Italian fleet, for both Italian and British communiq reported extensive naval and air-naval action in both ends the Mediterranean, involving the strongest ships of the Itall navy. These actions were indecisive, without significant los

The War in the Air *(April 9–June 18, 1940).*—Much of air activity during this period was closely related to the land a sea fighting and, in its broader aspects, has already been

ssed. What is stated here should therefore be read in conjunc-
on with previous discussions of the operations in Norway, the
ow Countries and France.

On April 10, apparently with the objective of hampering Brit-
n naval action in support of an expeditionary force to Norway,
e Germans made an important air raid on Scapa Flow, which
sted one hour and forty minutes. A few months later, such a
id would have been regarded as a rather minor affair, but at
at stage of the war, a raid in which 60 German planes partici-
ted (the estimate given by the British) was regarded as, and
as, one of the most important up to that time. The British
ported bringing down six German raiders and stated that dam-
e done was slight.

Immediately following their first landings, during the few days
hen Allied naval forces seemed able to interfere with their
oop movements by sea, the Germans moved considerable num-
rs of troops to Norway by air. It was estimated that they
uld transport about 4,000 daily in this way, but it was question-
le that much heavy equipment, tanks, armoured cars or even
avy guns could be sent in this way. These items were moved in
sea as soon as the German air power had reasserted control
er the narrow sea passages.

From the outset, the Allies were handicapped by operating
om air bases 200 to 400 mi. distant, or from naval plane carri-
s, while the Germans had advanced bases at Aalborg in Den-
ark. They soon established themselves also at Stavanger and
rgen and Oslo in Norway, which points were consistently and
avily bombed or shelled by Allied air force or naval vessels.
ry stormy weather during much of the campaign hampered
th air forces, but rapidly lengthening days in the far northern
titudes worked generally in favour of the Germans.

Superior air power was a decisive element in the German vic-
ry in Norway, where the Allied troops complained bitterly of
eir inadequate anti-aircraft resources, and in France and the
ow Countries, where the Allies had better opportunity to utilize
their own numerically inferior air forces. With the approaching surrender of France, a new phase in the air war opened, beginning with relatively important sustained air attacks on Britain by Germany and on Germany by the British. These will be discussed under the heading of the *Siege of Britain.*

There was one incident in the air war, isolated from the others, filled with poignant interest, in that it grew out of the naval battle at Oran and the British-de Gaulle attack on Dakar in the last week of September. During the Dakar attack, some of the French government's planes, disarmed under the armistice, had been rearmed and had attacked Gibraltar. More damage was apparently done by this brief French effort than by all the Italian attacks, but none of them was decisive.

Siege of Britain *(June 19 to Dec. 31, 1940).*—Beginning about June 19, just after France had asked for an armistice, the British and Germans began systematically attacking each other over widely spread areas with forces of about 100 planes daily, or nightly. Both sides contended they were aiming at only "military objectives," but it was plain that the war had reached that long-expected stage where "military objectives" were being given a very elastic definition and certainly included railway centres, ports, plane and munition factories. Numerous civilians were killed.

The Germans and Italians were openly talking of the great attack that was to destroy Britain, in which air attack was obviously to play an important part. The British were grimly determined to maintain the war alone and to destroy everything in Germany or Italy or in territory held by the axis nations that could help the expected attack. Britain's air position, always vulnerable, had now become deadly. She was faced with a possible combination of German, Italian and French air forces, of which either of the first two alone were numerically superior to the British. Her enemies controlled a long line of air bases, from northern Norway right down the west coast of Europe to Spain. All these were in easy flying distance of vulnerable spots on the British isles, some only a few minutes distant. All her sea approaches could now be covered by enemy air patrol and attack. All over Britain the country was prepared for invasion by para-

IE SAME FAMOUS DINING CAR in which the Armistice of Nov. 11, 1918, s signed at Compiègne was again the scene of armistice negotiations between rmany and France on June 21-22, 1940, after the latter's military collapse. ter the Germans moved the car to Berlin

chute troops, as well as by sea-borne forces. Many observers believed that if the Germans had invaded England immediately after the Dunkirk evacuation of the shattered B.E.F., they would have conquered Britain. Instead, they turned south against France.

The reason for that decision is a matter of speculation until the inner history of Germany's war command comes to be written. It is, however, now generally accepted that all the parties to the armistices, Germany, Italy and France, assumed that with France out of the war, the British would come to terms within two weeks. Certainly another powerful peace movement was launched behind the scenes.

Months later, after his retirement, Joseph Kennedy, then U.S. ambassador to Great Britain, was quoted as saying in private conversations that "the best people in England" wanted peace, but that Winston Churchill blocked it. It would perhaps be more accurate to say that the common people of England had at last been shocked into full realization of the fact that German victory meant virtual slavery and probably slow starvation for them and they turned resolutely against such a peace, obviously the only peace Hitler would have considered at the time. Winston Churchill embodied that belatedly awakened popular will in England, and it seems only fair to say that it included at least some of Mr. Kennedy's "best people."

Whatever the inner, hidden causes, there now began the unique spectacle of the literal siege of a great nation of nearly 50,000,000 people. Six months later, after appalling destruction, that siege showed no signs either of succeeding or of being raised, but soldiers, sailors and airmen of the beleaguered inflicted severe damage on the principal besieger, Germany, and disastrous defeats on the other axis ally, Italy. The siege had three phases: Direct invasion of England; increasingly destructive and savage air attacks and counterattacks; and increasingly destructive but not decisive blockade of sea lanes approaching the British Isles, maintained by both naval and air forces.

Up to the beginning of 1941, the direct invasion phase remained in the realm of rumour and legend. At least three different attempts at invasion of Great Britain were reported, all supposedly repulsed with great loss to the German invaders. Not the slightest official confirmation of any of these attempts was ever forthcoming from British or German or Italian sources. It is certain that extensive preparations for such an invasion were made by the Germans. It is equally certain that the British were fully aware of them and that numerous powerful and widespread raids were made by the R.A.F. on the "invasion ports," *i.e.*, ports from Norway to France which were opposite Great Britain.

Hundreds of craft gathered, even specially built, for the invasion were destroyed by the R.A.F. on these raids. It is even possible that the R.A.F. surprised and pounced on some of the numerous German elaborate practice embarkation rehear which were a standard part of German preparation for a m operation. This possibility might explain the stories of some sons returning to the United States from points on the Germ occupied French coast, who stated that they had seen hund (some said "thousands") of German soldiers' bodies floatin the English channel off Cherbourg and other points. What was the truth behind the rigid censorship curtain, up to the of 1940, no authentic information of an actual invasion was lished.

If no invasion was actually attempted, it may in part have due to the fact that the British spared no effort to make an attempt highly dangerous for the invaders. The broken B. was rearmed and, in the months from Dunkirk to the year's literally millions of men were added to Britain's trained garri Every possible landing was protected with barricades and a network of defensive positions grew up from Land's End to o' Groat's. Until the attack came and was repelled no man c say that Britain had been made impregnable. However, in months the country had been brought from a state of widesp vulnerability to become a veritable nation fortress, everyw and forever on guard.

One very important defence measure taken immediately a Winston Churchill became prime minister was the wholesale finement in prison or concentration camps of thousands of i viduals of uncertain loyalty. Where the Chamberlain governm had continually temporized with this danger of the fifth colu Churchill, with the examples of Scandinavia, the Low Coun and France before the nation, had no difficulty in securing most sweeping powers and no hesitation in using them.

Many of those arrested were refugees from Germany's onr Undoubtedly many innocent men and women were, for a t thus confined, but equally certainly hundreds of enemy ag were removed from the opportunity of undermining the coun defence effort. These latter individuals could, perhaps, never been reached if the government awaited admissible evidence u the usual rules of law. Scotland Yard and the army and ad alty intelligence had moral certainty of treasonable activi connections or intentions, which could not have been prove a court of law. Action on the reasonable suspicion was, theref a very important factor in the defence of England and it notable that England was the first country under German at where the fifth column tactic was a virtual failure. The mis of the fifth column in England was to bring about capitulatio agreement to a negotiated peace through highly placed press thereby in effect conquering Great Britain without the nee invasion of the British Isles. Failure of this mission forced Germany the unwelcome alternative of the long sea and a siege, with all the uncertain hazards of a prolonged war. drastic nature of the government's action was indicated by fact that those confined included not only aliens, but hi placed British subjects, including even a member of parliam

MORE THAN 2,500 LOST THEIR LIVES June 17, 1940, when the British liner "Lancastria" was bombed and sunk by German Stukas off St. Nazaire, France. As the ship rolled over, hundreds clung desperately to the sides. The British destroyer in the foreground rescued many of the 2,400 survivors

MULTANEOUS FIRE of four British anti-aircraft guns against German raiders the summer of 1940

arrest which was reviewed by the house of commons' parmentary committee on privileges.

Actual military operations accompanied all these political and ssive defence measures. German air raids steadily increased intensity. Hundreds and, eventually, perhaps 2,000 German anes participated in a single day's raiding. While all parts of ngland and Wales and many points in Scotland were raided, by r the greatest German effort was directed at London. This ase reached a climax in several great raids in August, in one of hich the Germans lost about 200 planes. During this period, avy plane losses were reported, but the reports of the British d the German authorities were hopelessly irreconcilable. eutral observers seemed agreed that the German losses were e heavier of the two.

After the August climax there was a period of several weeks of ickening, although hardly a day passed without destructive ids. Then a new phase of night raiding opened with a terically concentrated raid on Coventry on Nov. 14. For ten and half hours, incendiary and explosive bombs were rained on this idland industrial city. Hundreds were killed. This concentrated id was followed in the next few weeks by similar raids on outhampton, Sheffield, Bristol, Birmingham, Liverpool and other wns and cities, climaxed on Dec. 29 by a most destructive indiary bomb attack on the City of London, which destroyed any historical buildings.

Throughout these six months of a mounting inferno of often anton destruction and slaughter, the civilian population of Engnd won a world's admiration (and the Germans' surprised beilderment). As the civilian casualties mounted steadily into e tens of thousands (23,081 killed, 32,296 wounded) by the d of 1940, the British people's will to resist mounted with the isualties. The R.A.F., despite the pounding of English industrial entres, gained in striking power. Night after night they carried estructive raids deep into Germany and over the Alps to Italy. he Ruhr, Berlin, Bremen, Mannheim, Danzig, Pilsen in Bohemia-Moravia, Turin, Genoa, Milan and many other important transortation and industrial centres of Germany and Italy, felt the evastating force of the R.A.F. bombers. With merciless thorughness they pounded the seaports occupied by the nazis from tavanger and Bergen in Norway to Lorient and Bordeaux in rance, ports at which German preparations to invade England were made; ports and bases for the air and submarine fleet carrying on the German blockade.

As the year 1940 ended, the underlying concepts of the German and British air strategy were in vivid contrast. More and more, Germany had turned back to her terroristic philosophy of war, that widespread and ruthless destruction of an enemy nation, including civilians, was the surest means of breaking that enemy's will to resist. The British tenaciously clung to a studied concentration on vital points essential to the enemy's war effort.

Probably the British did more actual damage to military objectives, including in that term vital industrial facilities and transportation centres, but, proportionately, the damage to Germany was probably not as great as that to England. The German and German-occupied territory was much more extensive than the British; the British had a relatively limited number of planes, and those planes had much farther to fly to reach their targets. The nearest approach the British allowed themselves to the luxury of direct reprisal for mere destruction without regard to military advantage was three successive nights of incendiary and explosive bomb raiding on Bremen, following the wanton incendiary destruction of the City of London. Even so, the military value of the Bremen target area exceeded that of the City.

There was little change in the British blockade, except that they had to blockade a whole continent with fewer ships, operating from more restricted bases after France's fall. The German occupation of the western European littoral had, on the other hand, enormously increased Germany's power of blockade.

This factor alone threw a tremendous added burden on the royal navy and brought forth some inspiring chapters of British naval history, where much attenuated convoy guards did heroic service in protecting their charges against the gravely increased hazards of submarine attack and air spotting and bombardment. One of the great epics of this period was the gallant action of the converted cruiser "Jervis Bay." This 14,164-ton former cargo-passenger liner was the sole guard of a 38-ship convoy which was attacked 1,000mi. out in the Atlantic by a German warship, apparently of the pocket battleship "Luetzow" (old "Deutschland") class, mounting 11-in. guns.

The "Jervis Bay," devoid of armour and mounting 6-in. guns, sailed in between the "Rangitiki," first ship of her convoy to be attacked, and the enemy warship. She soon went down, in flames, with her light guns firing as her decks were awash. But 32 of her 38 convoyed ships escaped that night of Nov. 5 under

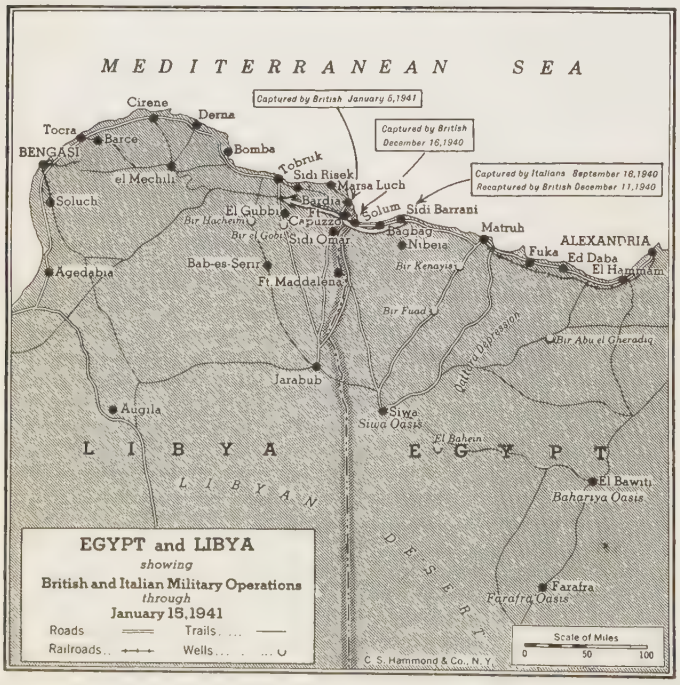
cover of her gallant diversion and her captain, E. S. F. Fegen, received the Victoria Cross—posthumously.

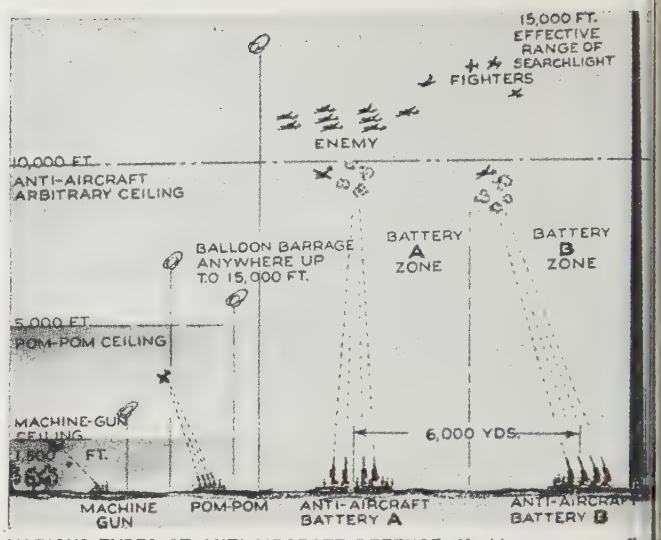
With the enemy in possession of French and Belgian ports and air bases on the very shores of the channels approaching England and with their own ships denied the use of Irish bases, the British destroyer strength especially was terribly overworked. In the late summer, this weakness was somewhat remedied by an arrangement with the United States, whereby 50 older American destroyers, previously out of commission but still effective ships for convoy duty, were added to the British fleet in exchange for leases on British air and sea bases in the western hemisphere. This was the longest step the United States had made toward direct intervention in the war.

The Anglo-Italian War (*June 10 to Dec. 31, 1940*).—When Italy entered the war on the side of her axis partner on June 10, 1940, she had already rendered considerable aid to Germany. She had created one decidedly weak spot in the Allied blockade and, after the invasion of the Low Countries and France, had forced France to keep much needed divisions immobilized on her Italian frontier, when every man was needed to meet the German invasion.

Italy brought into the war an army of possibly 60 divisions, say between 1,250,000 and 1,500,000 men, excluding native troops in her colonies. She also boasted of a total organized man power of more than 9,000,000, but the military value of most of these was very dubious, if for no other reason than her inability to equip and maintain much more than the 1,500,000 men of the army. The quality of the army itself was far from uniform, ranging from the Alpini divisions, regarded as excellent troops, to large numbers of dubious quality who had never been tested in battle.

Italy brought into the war an air force, in numbers superior to that of France but definitely inferior to that of Germany. She was credited with perhaps 6,000 planes, of which about 3,000 were in active operating squadrons. Many of these planes were obsolete. The Italian navy roughly equalled the French. Inferior in capital ships, Italy was superior in submarines, torpedo boats and other craft designed for waters such as the Mediterranean and adjacent seas. She had sufficient gasoline and fuel oil for a short war, but very limited means of replenishment. Her industry depended on the outside world for materials.





VARIOUS TYPES OF ANTI-AIRCRAFT DEFENCE. Machine guns are effe only up to about 1,500 ft., pom-poms (automatic cannon) up to 5,000 ft., anti-aircraft guns to 20,000 ft. or more. In co-ordinated defence with fig planes, the anti-aircraft batteries often concentrate at levels below 10,00 while the planes cover areas above that height. In this way the guns keep bombers high and do not shoot down their own planes

Italy's part in the defeat of France was rather passive and very impressive. Up to July 10, Italy's part in the war was fined to numerous air raids on Malta, some attacks on Bri and French naval units by air and several minor colonial r in north and east Africa.

On July 10 Italian and British naval forces fought indeci actions in both ends of the Mediterranean. Italian ships in t minor engagements began to establish the reputation t eventually became noted for, that of their ability to avoid ac with the British fleet.

During the latter half of Aug. 1940 the Italians launche vigorous offensive against British Somaliland. In a short c paign they succeeded in wresting control of this desolate entirely from the British. The colony had so little value econo cally and such limited military value that there was suspi that the Italian attack was intended as a diversion to draw s British forces from Egypt. If so, the attempt failed utterly accomplish this objective.

About one month later Marshal Rodolfo Graziani launched main attack on Egypt across the Libyan desert. He penetra within a few days to Sidi Barrani, some 70mi. inside the Egyp frontier. Here he paused to consolidate his forces for a rene advance against the British at Matruh and beyond to Alexan and the Suez canal—at least so it was supposed. However, mo passed and the Italians made no further forward move.

Suddenly on Dec. 9 the British struck west and two days l reoccupied Sidi Barrani. Striking with a powerful force mechanized troops they shattered the Italian armies, took s 40,000 prisoners and by Dec. 16 had retaken Sollum, virtually the frontier. They immediately crossed the frontier and inve Bardia. After a fierce 20 days of long range siege by a artillery, naval guns and air force, Bardia was taken by ass by the Australians on Jan. 5, 1941. More than 30,000 additi prisoners and great quantities of war material were taken. loss of between 80,000 and 95,000 troops had made serious inro on even the large army Marshal Graziani had gathered. morale of his men was reportedly low, according to some advi because the men felt their navy had deserted them. The Ita people and army had been told such triumphant stories of Ita control of the Mediterranean that its utter uselessness in North African campaign, either as a fighting force or to con supplies, very likely had a most depressing and even demora

ıg influence on the troops.

Beginning with the utter passivity of the Italian fleet while ıe British under Vice-Admiral Somerville were shooting the aval terms of the armistices to ribbons at Oran, right to the end f the year 1940, the performance of the Italian navy was the ıost inglorious record of Italy's very inglorious first six months f war. Although the Italian duce and various spokesmen in the alian press made repeated and sweeping claims that the Mediterranean was already truly Italy's "mare nostrum," the British omplained that they were unable to bring the Italian fleet to ction.

Various minor items of news from time to time seemed to ırow some doubt on the complete accuracy of the Italian claim, s when they announced "successful" aerial bombing attacks on ritish convoys where it was previously understood the British ıipping had been swept from the sea. Perhaps the most revealıg of these minor incidents occurred during the week of July 20. he Italian cruiser, "Bartolomeo Colleoni," in company with anher Italian cruiser encountered the Australian cruiser "Sydney" ıd a small destroyer escort off the island of Crete. The Italian ıips were modern and the "Colleoni" was rated as one of the ıstest cruisers in any navy. Both Italian ships sought to avoid ction, but the "Sydney" closed with the "Colleoni" and sank her. he "Colleoni's" sister cruiser apparently made full use of this portunity to effect her escape, for the "Sydney's" captain, after aving the final destruction of the defeated Italian ship to his estroyers, along with the rescue of the Italian survivors, was bliged to report later that he had been unable to overtake the her Italian cruiser.

This naval war in the Mediterranean was as much an air war as ıe of surface naval craft. More and more the Italians depended ı their air force to make raids on the British fleet units, parcularly those in the harbour of Alexandria. As week followed eek in the unsuccessful British effort to seek out the Italian fleet ıd force it to accept a general action, the British themselves ıd to turn to the fleet air arm.

An important part of the Italian fleet was eventually located the inner harbour, Mar Piccolo, at Taranto. One moonlight ight in mid-November, the British planes came over Taranto and tacked, principally with torpedoes. When the attack was over, ıe British claimed that one 35,000-ton battleship had been partly ınk, one—possibly two—23,600-ton battleships had been eached, two cruisers and two supply ships had been badly damged. At very nearly the same time, other surface units of the ritish fleet attacked an Italian convoy bound for Albania in the trait of Otranto. Following a similar attack only a day earlier ı another convoy en route for Libya, the conclusion was inesıpable that the Italians had lost control of the Mediterranean assages (if they had ever held it).

These developments carried most important implications for ıe outcome of the two major land campaigns in which Italy ad by now simultaneously involved herself, in North Africa and Albania. After the loss of Sidi Barrani and the British advance ıto Libya, Marshal Graziani bluntly laid the blame on his own ıechanized inferiority to the British. He had previously been reorted to have delayed his advance from Sidi Barrani because f lack of mechanical equipment he had asked from Italy.

In contrast to Germany's position, all Italy's armies in action ere separated by considerable bodies of water from their homeınd and were operating in theatres of war which offered little or o possibility of replenishing supplies, especially of munitions nd equipment. Consequently, any action which threatened to ever the communications of these forces with Italian bases was raught with the gravest peril, even of complete disaster for these verseas forces of imperial Italy.

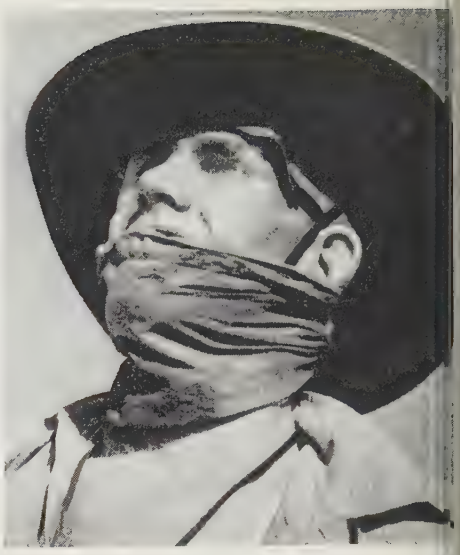
As if to give point to this vital lesson, the British fleet, a month after Taranto, actually steamed through the Strait of Otranto and, including battleships, stood off Valona on the Albanian coast and bombarded that important Italian debarkation point with 100 tons of shells. They then returned to their own bases and reported not seeing any Italian warships throughout the operation. Reports that Italian forces in Albania were being reinforced by air gave tacit confirmation to the fact that not only did the Italian fleet not control the Mediterranean, it had even lost effective control of that decidedly Italian lake, the Adriatic sea.

Indeed, 1940's last approach to a general action between the British and Italian naval forces had taken place nearly a month earlier on Nov. 26 off southern Sardinia. Planes having discovered the Italian ships, the British Gibraltar squadron, led by the battle cruiser "Renown," closed in and opened fire at extreme range. The Italians put down a smoke screen and retired toward the shelter of coastal batteries and of land-based bombers. The British turned away and the remaining stages of the action were aerial.

Both sides claimed victory in the fight off Sardinia. Claims of losses were conflicting, the British claiming to have torpedoed one Italian battleship, damaged three cruisers and two destroyers and shot down two planes. They conceded a hit on one of their own cruisers and one plane missing. The Italians claimed they had damaged one British battleship, three cruisers and an aircraft carrier and shot down seven planes. They admitted serious damage to one destroyer and the loss of two planes. Regardless of the conflicting claims of losses, the subsequent course of events in the Mediterranean rather clearly indicated that the British remained in effective control of that sea, and were continuing to seek action, which the Italians were seeking to avoid.

THE ITALIAN FLEET at Taranto was dealt a damaging blow by British torpedo planes on the night of Nov. 11-12, 1940. This photograph of the harbour, taken by a British reconnaissance plane, shows two damaged cruisers (above) surrounded by oil slicks. The British also claimed that two or three battleships and two fleet auxiliaries were disabled

BRITISH Bren gun carriers patrolling the ruins of Fort Capuzzo near the Libyan-Egyptian border after the fall of the Italian outpost Dec. 16, 1940



IMPROVISED PROTECTION against sandstorms wo by Australian troops during their Libyan campai which opened in Dec. 1940

BRITISH field gun shelling Bardia in the first week of 1941

AUSTRALIAN TROOPS rushing through the streets of Bardia, Libya. Bar was captured by the British imperial army of the Nile Jan. 5, 1941

ITALIAN PRISONERS by the thousands filed out of the ruins of Sidi Barrani when the British recaptured this western Egyptian town Dec. 12, 1940, at start of their drive into Libya

Excluding the debated losses in the Sardinian fight, British stimates of respective naval losses of the Italians and themelves had been 1 Italian cruiser, 10 destroyers, 24 submarines, submarine depot ship and 1 store ship; while 3 battleships had een badly damaged, along with 2 cruisers and 2 fleet auxiliaries. The British losses were given as 1 light cruiser, 1 destroyer and submarine.

At the turn of the year, the British naval forces took an ctive and very effective part in the defeats inflicted on the talians in Libya, notably in the capture of Bardia. It was notable hat with this serious and steadily growing threat to the army f Marshal Graziani, one of Italy's best, strongest and most imortant, the Italian fleet left the British naval forces entirely nmolested to collaborate with the British land and air forces n the invasion of Libya.

Greek-Italian War in Albania *(Oct. 28 to Dec. 31, 1940).*—Following several exceedingly provocative moves against Greece, ncluding the sinking without warning of a Greek cruiser and illing Greek pilgrims at a religious festival, the Italians on the ight of Oct. 27–28 delivered an ultimatum to the Greek governnent, which was followed within three hours by invasion of that ountry. Much discussion has since taken place, without definitely ettling the matter, as to whether this Italian adventure was part f the axis plan of war, or was a private move on the part of the talian dictator in an effort to impress his Berlin ally with a reater sense of his and Italy's importance. Whichever was the rigin of the attack on Greece, developments to the end of 1940 epresented a decided setback to the Italians.

When the attack began, Greece probably had no more than 50,000 effectives capable of being maintained in the field. She ad an estimated 600,000 indifferently trained reserves. Her quipment was not standardized and was largely obsolescent. Her ir force was estimated not to exceed 200 planes, few of them nodern, while her navy has been truly called "microscopic" in omparison with the formidable Italian fleet. At the war's outreak the Greek navy consisted of 1 obsolescent cruiser, 10 estroyers, 13 torpedo boats and 6 submarines and minelayers.

With this estimate of military strength it would not be surrising that the Italians really believed Greek resistance would e merely nominal, as they were reported to believe. The outside vorld certainly was as much surprised as the Italian high comnand, when the Greeks not only resisted, but pushed the Italian rmies out of Greece and deep into Albania.

The first few days of the Italian invasion indicated the use of elatively small forces, with no great vigour behind the attack. This supported the viewpoint that the Italian government did not eally expect serious resistance. Shortly after the opening days, he Italian military pressure was increased and Italian troops ucceeded in advancing into Greek territory at all points along he Greek-Albanian frontier. Particularly in the north did the talian pressure seem to be strong, where it appeared they were leveloping a major thrust toward Salonika. It subsequently deeloped, however, that this advance went considerably further n the Italian announcements than it did on the ground.

What the Greek army lacked in equipment and size was amply ompensated in terrain. The invasion road lay through one of the nost mountainous, inaccessible pieces of terrain in Europe, with nuch of the country some 7,000ft. above sea level. Added to his, the Greek soldiers showed splendid fighting qualities. The talians heralded their real effort with widespread air raids on Greek cities and on the battle areas. Notwithstanding this, their dvance began to slow down after the first week and soon came o a standstill.

Another precedent of the larger war was shattered. For the rst time since Germany set out on her career of conquest, the British were able to render appreciable aid promptly to a victim of unprovoked aggression, whose territory they had guaranteed. This first took the form of air reinforcements, followed quickly by landings at various points on the Greek coast and islands.

Up to the end of 1940 the precise extent of the British military aid was not officially revealed. At the outset, it was thought that the British would not be able to spare much from their vital problem of holding Egypt against the menace of Graziani's Libyan army which had reached Sidi Barrani. The completeness with which the British disposed of this menace six weeks after the Greek campaign began suggested that British North African strength had been underestimated, and it is entirely possible that their reinforcements to the Greeks were in like manner underestimated.

Something much more important was involved. The Italian effort, when it failed to succeed, exposed Italy to the menace of vastly increased basing facilities for the British air and naval forces, much nearer Italian cities than anything the British had had before. In this respect the Italians took the same risk in invading Greece that the Germans had taken more than six months before in their Norwegian invasion. In the first case, the invasion succeeded and strengthened the invaders' position both for defence and attack. In the second, the invasion failed and was soon turned into a serious threat to the invader's home bases. It is more than probable, for example, that the disastrous British raid on the Italian fleet at Taranto was at least facilitated by the new bases made available to the British by the Italians' ill-judged gamble in Greece.

Another set of considerations gave weight to the thought the Greek attack was indeed an Italian gamble, not sanctioned by the German command as axis strategy. The most cardinal principle underlying German strategy from the beginning of the war had been not to risk a major campaign on two fronts simultaneously. The swift disposal of Poland in Sept. 1939 had realized this cardinal objective. Obviously, a setback in Greece, guaranteed by the British, would give an opportunity for the British to open up a new eastern front. Clearly, then, if an attack on Greece was to be sanctioned at all, it would have called for the same thorough preparations as had preceded the Scandinavian and Low Countries' invasions. This would have been true even if the German high command had shared the Italian expectations of an easy victory, for the Germans did not take risks of such incalculable magnitude on the basis of hope.

The Italian invasion of Greece had not been under way ten days before it became evident the preparations for it were exceedingly incomplete. This was followed by weeks in which Berlin studiously ignored their ally's plight and semi-official spokesmen in both Rome and Berlin indicated that Germany would not intervene in the Greek campaign. Only after Italian armies had been shattered and thrown back far into Albania and while the British attack on Graziani's army in North Africa was gaining momentum, did the Germans at last move to assist Italy during the last two or three weeks of 1940.

Within less than one month after the Italians had crossed the Greek frontier, not an Italian soldier remained on Greek soil. The Greeks had launched a vigorous counteroffensive and had taken an important Italian base at Koritza, Albania, to be followed in the next two weeks by the fall of Argyrokastro, Porto Edda (Santi Quaranta), and other bases. At the close of 1940, the Greeks were in possession of approximately one-fourth of Albania and had evicted the Italians from every port of debarkation except Valona (Avalona) and Durazzo, both of which had been heavily bombed and bombarded by British and Greek planes and warships.

Co-operating with the British air and naval forces, the Greeks

had swept through the Strait of Otranto with their tiny navy and had destroyed Italian transports and supply ships with their somewhat ancient submarines. British air raids against Italian cities, possibly with Greek planes participating, had been delivered on such ports as Bari and Brindisi. In addition, heavy British air raids on the other side of Italy at Naples and other south Italian points had illustrated the new risks Italy had brought on herself by enabling the British air force to establish bases on Crete and other Greek islands. Whereas before the attack on Greece, the R.A.F.'s nearest bases at Alexandria and Cyprus had been about 1,000mi. distant, now they were only 300 to 600mi. away.

The veteran Italian chief of staff, 69-year-old Marshal Pietro Badoglio retired from the Italian command, followed by several leading military and naval commanders. Circumstances suggested that these retirements did not necessarily express lack of confidence in the retiring officers.

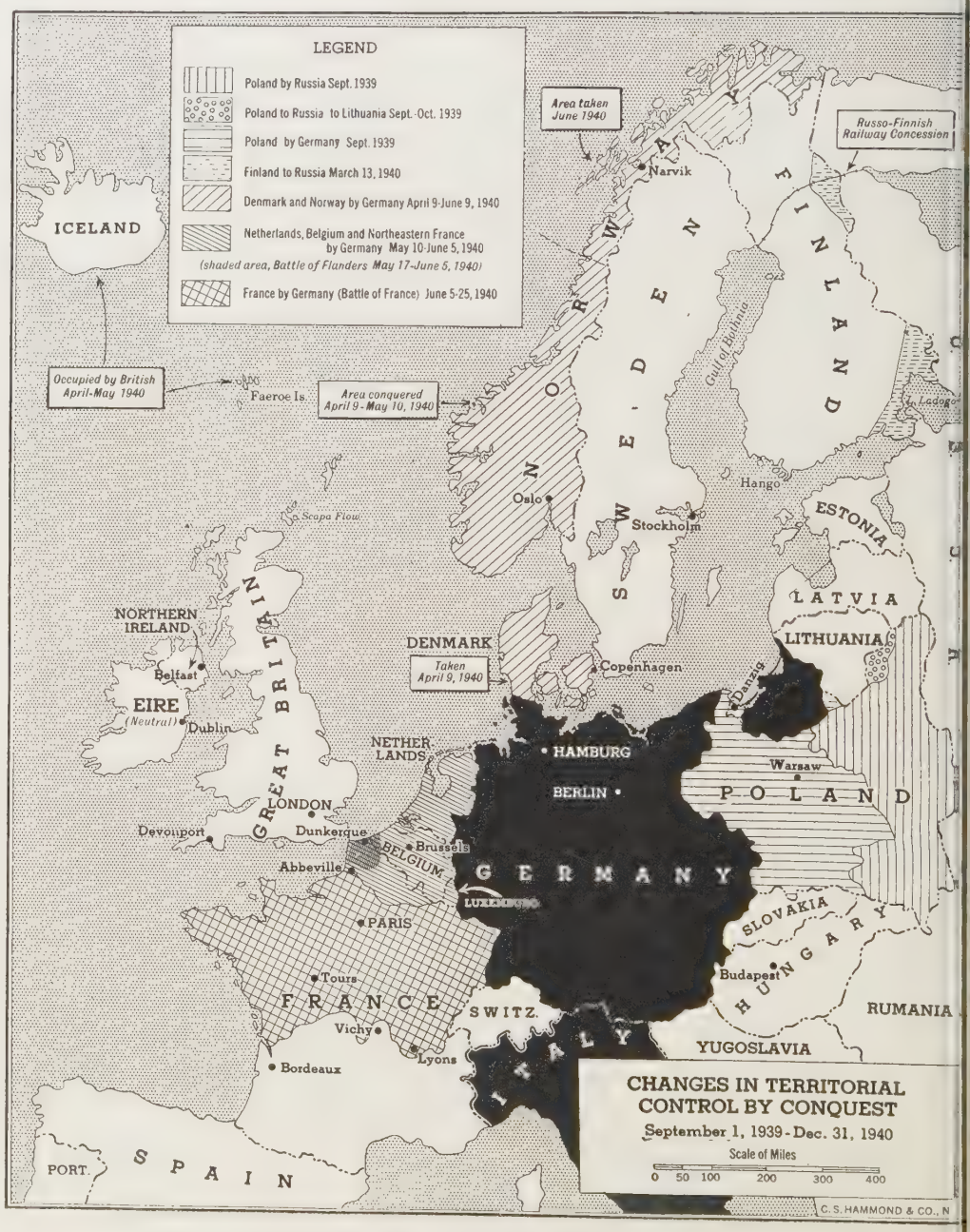
There were indications, not conclusive it is true, that these officers had expressed criticism of the fascist policy which had led to the reverses in Greece, Albania and North Africa; the bombing attacks on Italian cities and home naval bases; the growing pinch of the blockade and the prolongation of a war which most Italians had expected to run only a month or so after France fell in June.

It was observed that the official notice of the retirement of these officers was in each case phrased in the unusual form "by a royal decree, about to be signed." From the time fascism came to power, no act requiring the royal assent had ever before been announced until the king's signature was actually on the decree. It was also noted that all the retiring officers had been identified as "king's men"; *i.e.*, more loyal to the House of Savoy than to Mussolini's fascist party and government.

Some observers even inclined to the belief that the belated movements of German troops into Italy might be as much to stabilize the internal Italian situation as to reinforce the Italian armies, now apparently largely cut off from the homeland both in Albania and in North Africa. A very direct invitation to the Italian people to overthrow Mussolini came from Winston Churchill in a radio broadcast, which, it was reported, was broadcast on Italian wave lengths in Italian more than an hour before it was officially given by Mr. Churchill in London. Many read a similar indirect suggestion into a New Year's message sent by President Roosevelt the United States to King Victor Emmanuel III of Italy. Up the end of 1940 neither appeal had produced any apparent resu

The Situation as 1941 Began.—Sixteen months of war I seen radical changes on the map of Europe. Nine Europ nations had fallen completely under either soviet Russian or n German domination; two others, France and Rumania, had l large areas to invaders and exercised the remnants of th sovereignty under German control; Finland had lost some of most important regions, although she still preserved her nomi independence.

Commerce between the two greatest consuming areas of earth's surface, North America and the continent of Europe, I been almost destroyed, while to Great Britain the commerce w largely dominated by war needs and carried on through the pe of sea and air attack, which had reached destructive proportio Commerce between the United States and the principal orien nation, Japan, had been sharply curtailed by embargoes impo by the United States on certain war materials, following Japa adherence to the Rome-Berlin axis.



The year had seen in the military sense the utter discrediting, often seen before in thousands of years of military history, the theory of the defence as supreme to attack. Once again eat and imposing ramparts had proved useless. Just as the ordes of Genghis Khan had made a mockery of the Great Wall China, so, seven centuries later, the hordes of Hitler's nazi ermany had overrun the country behind the "impregnable" laginot line, and had done so with losses throughout the mpaign less than each side had suffered in single battles of the orld War, 1914–18.

The use of the German air arm as long range artillery was a w technique, but the principle of concentrated artillery preparaon was basic in Napoleon's campaigns. The daring penetration d wide sweeps of the mechanized forces were at least as old the cavalry tactics upon which the world-sweep of the Monls had been based, when the hordes overran Eurasia from the ellow sea to the Adriatic. Steel tanks and modern weapons ere simply more enduring mounts and more destructive than the aggy Mongol ponies and their hard bitten riders. The British ctories in North Africa over the Italians pointedly illustrated at it was correct application of the principles of war through the e of modern equipment which was decisive, and not some semiystical prowess attached to German arms.

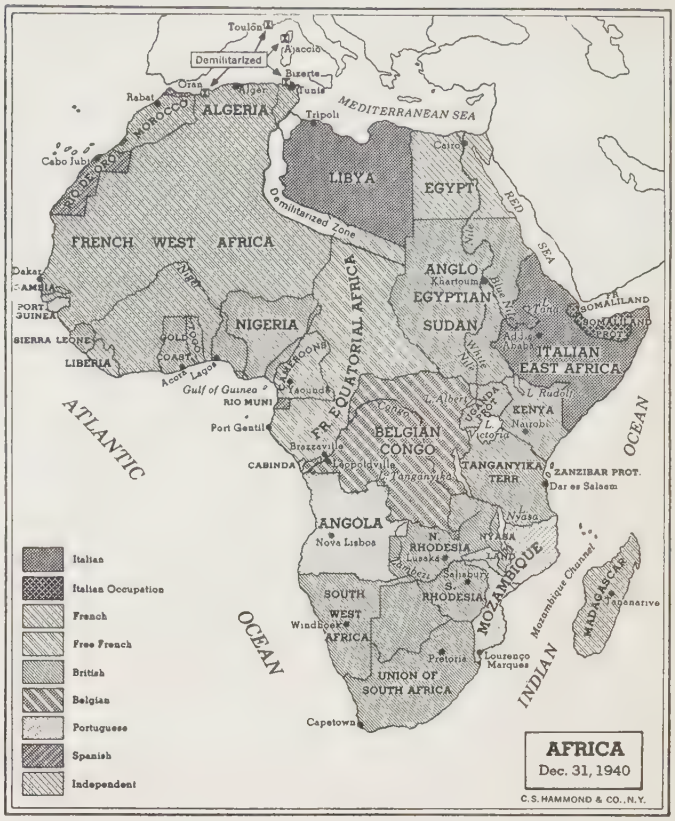
In the North African campaigns, notwithstanding all that had en expected from air power operating over narrow seas against surface fleet, the principles of Admiral Mahan, of Lord Nelson d of sea warfare back to the days of Rome and Carthage, were ain exemplified. As Nelson's frigates defeated Napoleon's nquest of Egypt at Aboukir bay, so the British navy repelled raziani's attempt and opened the road for the Italian disasters Libya, the keystone of the Italian empire.

Such were the great changes of the first 16 months of war; such ere some of the outstanding lessons of those changes. History owed the lessons to be new only in detail; history also incated that the changes, great as they had been, might be transiry. Germany in 1917 controlled more territory than she did in 940 and one year later had been reduced below the total area of e German states when Bismarck formed the German reich. apoleon's empire had been as widespread as the German conests of 1917, wider than those of 1940, in 1813, and after aterloo in 1815 had shrunk to France.

With this lesson of the instability of territorial conquest, it as but natural that men looked into 1941 with efforts to pierce e veil of the future and appraise the course of events to come. his has ever been a task as vain as it is alluring, but certain ighty forces had been set in motion by the events of 1939–40 hich promised to become more clearly operative in 1941. Analys of these could be made intelligently and did offer some clue to the probable course of events.

It had become increasingly evident that this war was in very uth a revolution, a war to impose a new order on the world and destroy the old one. It was notable that, whereas many in the mocracies had feared that the "masses" and "labour" would t be loyal, that it was in fact the masses of the British people ho resolved to carry the war on after every ally had fallen, hile the proponents of peace were found principally among the -called "upper classes." Here was a profound political and ychological phenomenon of the war and the times.

Hitler himself may have given the best answer, although paraxically he was pre-eminent in failing to grasp its inner sigficance. He, the master of mass psychology, had described the owd as "feminine," as "feeling" its way to great decisions, ther than "thinking." Dimly at first, but vividly as their attered B.E.F. left the lurid beaches of Dunkirk, the people Britain felt that German victory would mean the end of their



cherished individual liberties, the product of nine centuries of struggle. They neither knew nor cared much about the finespun ideological philosophies of democracy and totalitarianism, but they did sense that the very soul of democracy, the thing which alone gave it meaning and made life worth living, was individual liberty and they finally believed Hitler when he said his goal was to destroy liberty.

Where the appeasers of wealth and position could reason their way to some kind of compromise solution, illusory, as logic so often is when dealing with human nature and realities, the masses, moved by instinct, came to the simple conclusion that they were merely offered a choice between living as pauperized slaves, dying slowly as a nation, and dying, but perhaps living, as freemen. This spirit hardened a heroic people to carry through one of the most soul searching ordeals ever faced by a nation. It won from the German press the unwitting and certainly unintended compliment of asking, "Are these English 47,000,000 Churchills?"

This spirit gave to the flesh and blood defences of England a strength which the insensate concrete and guns of the Maginot line had lacked. But more was needed to defeat such an enemy as nazi Germany and all her modern weapons.

The Emergence of the United States.—That more could only come in decisive measure from the United States, the only great industrial nation still beyond the axis reach. England was a mighty workshop. Her production of weapons as 1940 ended was probably greater than that of the United States, but it had reached its peak. That workshop was at the very doorstep of the enemy. It was concentrated and extremely vulnerable to one of two weapons in which Germany excelled. It was vulnerable both to direct air attack and to indirect attack on the lines of supply of food and raw material which were essential to it. In the last analysis of man power, it could barely match half of Germany's resources, and, even if it had equal man power, at the end of 1940 it had only the precarious toehold on the continent of Europe, under axis domination, which was afforded by the Italian fiasco in Greece and Albania.

Under these circumstances, it was evident that the position of the United States could well be decisive in 1941. Granting that Britain could beat off invasion, which seemed reasonably probable, and could maintain her life under endless air and underseas siege, which seemed somewhat less certain; provided she could do these two things for perhaps six months, perhaps nine months of 1941, then the United States strength, if thrown on her side, would probably ensure the defeat of the axis powers and would certainly make their victory impossible. Through the last five months of 1940, the United States had swung steadily toward the side of Great Britain.

The actual supplies sent to Britain, while substantial, were almost certainly exaggerated—and they were all bought and paid for.

They were not an ally's aid.

Immediately after his election for the third time as president of the United States, Franklin D. Roosevelt made ever more plain his determination to give all possible aid to Great Britain. Toward the end of 1940 he dropped even the qualifying phrase of "all aid, short of war." He interpreted his election as a popular verdict for this, his foreign policy. There was general agreement that a majority of the people did lean in this direction, although probably not so far as the president knew he and the nation would eventually have to go.

The United States began, under a Selective Service act, which was conscription, to raise a huge army with an ultimate potential strength of 4,000,000 men. Ever increasing pressure was exerted to put the nation's industry on a war basis to arm and equip this huge force. Important changes in the command and distribution of the American navy were announced just after the beginning of 1941, pointing clearly to preparation for the contingency of war in both oceans.

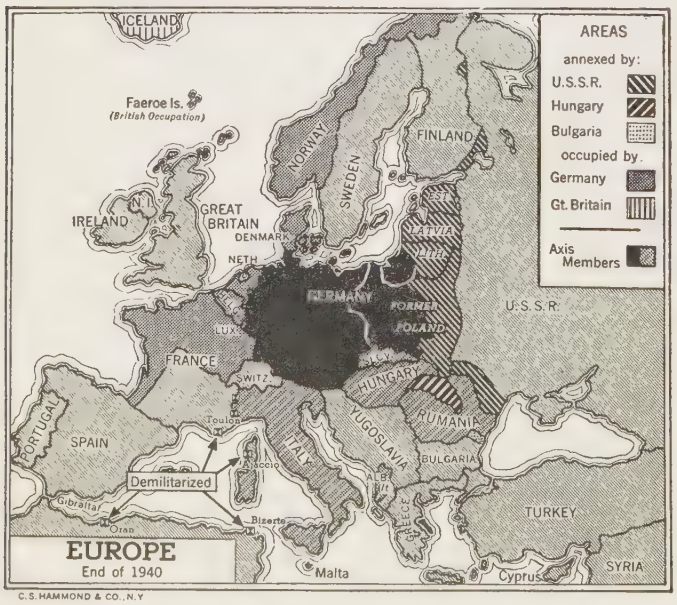
The handwriting on the wall of American destiny grew ever plainer—from strict neutrality, the U.S. seemed to be shifting rapidly to an active part in the war.

The president of the United States in a public address cited Adolf Hitler's statements that his, the nazi way, and the Anglo-Saxon way of individual liberty, could not both continue to exist in the world. Having cited these words, the president drew the consequences:

That since America would not yield to nazi ideology, it must prepare to fight.

For important related topics, *see* also ADVERTISING; AIR FORCES; ARCHITECTURE; ARMIES OF THE WORLD; BALKAN ENTENTE; BLOCKADE; BANKING; CANADA; CHEMICAL WARFARE; CHILD WELFARE; CHINESE-JAPANESE WAR; CONTRACT BRIDGE; COTTON; CZECHOSLOVAKIA; EDUCATION; EDUCATION, SECONDARY; EDUCATION, VOCATIONAL; EXCHANGE CONTROL AND EXCHANGE RATES; FINANCIAL REVIEW; GOLD RESERVES AND GOLD STANDARD; HISPANIC AMERICA AND THE EUROPEAN WAR; HORTICULTURE; HOSPITALS; INTERNATIONAL LAW; INTERNATIONAL TRADE; IRON AND STEEL; JAPAN; JEWISH RELIGIOUS LIFE; LIGHTNING WAR; LUMBER; MINERAL AND METAL PRICES AND PRODUCTION; MUNITIONS OF WAR; NAVIES OF THE WORLD; NEUTRALITY; NEWSPAPERS; PACIFISM; PETROLEUM; PROPAGANDA; RAILROADS; RELIGION; SPAIN; STOCKS; STRATEGIC MINERAL SUPPLIES; STRATEGY OF THE EUROPEAN WAR; TACTICS IN THE EUROPEAN WAR; TARIFFS; ZOOLOGICAL GARDENS; *see* also articles on the various belligerent countries.

(G. F. E.)



Evacuation of Children: *see* CHILD WELFARE; EDUCATION, ELEMENTARY: *Great Britain;* EDUCATION, SECONDARY; RAILROADS: *Railways in Wartime;* REFUGEES; RELIEF.

Events of the Year: *see* CALENDAR OF EVENTS, 1940, pages 1–16.

Excavations: *see* ARCHAEOLOGY.

Exchange Control and Exchange Rates.

Three outstanding developments dominated the foreign exchanges during 1940. The most important was the spread and intensification of exchange control. Correlative with this was the elimination of virtually all free exchange markets except New York, while that remaining one became increasingly thin.

Finally, the invasion of the western European countries led to the disappearance of five important currencies from the exchange markets and the inclusion of the invaded areas within the British blockade.

The monetary agreement between Great Britain and France signed in Dec. 1939, was so short-lived as to be barely worthy of note. This fixed the franc-sterling rate at 176½ francs to the pound and established an unlimited clearing account between the sterling and the franc groups of countries. Although with the fall of France this agreement lapsed, the clearing technique continued to be used among the members of the sterling area (the British empire, including mandates and protectorates, but excluding Canada, Newfoundland and Hongkong; also, Egypt, the Anglo-Egyptian Sudan and Iraq).

British exchange control developed rapidly from relatively mild measures at the outbreak of war in 1939 to virtually complete control by July 1940. The earliest of these consisted in the spread, through transfer agreements with various countries, of the clearing machinery to many British payments. Special accounts were set up by each partner, into which all outward, and from which all inward, payments were made in domestic currency at an officially established rate of exchange. One by one these countries, after Dec. 1939, entered into such arrangements: Sweden; the Dutch and Belgian colonies; Rumania, Argentina and Brazil; Portugal and Hungary; Greece, Peru and Uruguay; Bolivia; Chile; and Spain.

A second important step in the extension of exchange control occurred in March 1940, when invoicing in foreign currencies was made compulsory for British sales to non-sterling areas of whisky, tin, furs, rubber, jute and manufactures thereof, together with the sale to the exchange authorities at the official rate of foreign currency thus made available. This measure drastically reduced the foreign demand for free sterling. Since steps were not taken simultaneously to cut down the supplies allowed to reach the free

arket, the free sterling rate fell promptly from $3.90 to $3.72⅜ nd by the end of March to $3.45½.

Early in June another sharp extension of exchange control was nnounced, effective July 17. Not merely specified commodities, ut *all* exports to the United States and to Switzerland were to e payable only in dollars (or Swiss francs) or in official sterling. y co-operative arrangements with the Federal Reserve authori- es and with American banks a system of "registered accounts" opened with British banks in the name of American banks or rge enterprises) was establisned to handle payments in official erling.

While the demand for free sterling was thus being reduced, the pply side of the market was likewise being effectively strangled. he issue of licences for the sale in the United Kingdom of reign-owned British securities was prohibited, while current mmercial and financial payments to the United States and witzerland were made eligible for foreign exchange at the fficial rate.

All that remained of the free market was, on the supply side, reviously existing sterling bank balances, and on the demand de, certain debts already outstanding and financial payments the United Kingdom. Exchange from exports to Britain (sub- ct in any event to British licensing) *could* be sold on the free arket, but *would* be only if the free rate were as high as the fficial rate. Thus free sterling became "an emptying pool re- iving no replenishment." As a consequence of these measures, e free rate recovered from the historic low of $3.00 reached n May 10, 1940, to an average of $3.60 in June and to parity ith the official rate by September. The only other steps of oment in the intensification of British exchange control were e prohibition, on Aug. 27, of the import of Bank of England otes into the United Kingdom, and the banning (October) of e import of bearer securities except when permitted by the oreign Exchange control.

Except where they applied specifically only to the United ingdom, the aforementioned measures affected the entire sterling rea. They were supplemented in various ways by the individual ominions or colonies.

The free exchange rates of Australia and New Zealand, which ere depreciated relatively to the pound, fluctuated with sterling roughout 1940. The Indian rupee and the Singapore dollar, n the other hand, after fluctuating fractionally during the early art of 1940, were in April pegged at a rate corresponding to fficial sterling. The Union of South Africa, as the major gold roducer, confronted with a strong demand for her currency, avoid rapid exchange appreciation established a controlled ate ($3.98) in February of the same year.

Although not technically a member of the sterling bloc, Canada troduced similar controls over her foreign payments and con- ned the "free" market principally to the tourist trade. In arch 1940, a regulation was issued requiring all exports to be aid for in foreign currencies. The consequent reduction of the emand for free Canadian dollars accounted for the sharp dis- ount which immediately appeared in New York. In April, pay- ent for all imports obtained through the United States was re- uired in the country of origin, thereby substituting for the most art the use of sterling in place of dollars. Residents of Canada ere ordered to sell all foreign currency holdings in their posses- ion to authorized dealers.

In July, exchange available for pleasure travel in the United tates was made subject to application to the Foreign Exchange ontrol board and the maximum monthly amount of foreign ex- hange purchasable without licence was fixed at $100, later in he month being reduced to $25. Finally, a further saving of ollars (U.S.) estimated at $5,000,000 to $6,000,000 a month was effected in December, when parliament passed a bill suspending imports from the United States of virtually all luxury manufactures. (Simultaneously, a parallel bill imposed a 25% excise tax on similar Canadian manufactures.)

Developments bearing upon the European exchanges followed three main lines: the disappearance of the currencies of the invaded countries from the world's markets, efforts of Germany to create a continental economic bloc and a general tightening of exchange controls in the non-invaded countries. New York ceased quoting the French franc, the belga and the guilder on May 10. Balances of the invaded countries in the United States were promptly frozen as they had been in Great Britain and quite widely in Latin America. The United States later also blocked accounts of the Bank for International Settlements, Rumania and the Baltic countries taken over by the U.S.S.R. The state department soon authorized the minister of the Netherlands to operate all accounts of his government, while in October the treasury released sufficient French funds to finance all their diplomatic establishments in the western hemisphere.

German moves to consolidate Europe economically which are of interest here included the establishment of an exchange rate of 20 French francs and 132.70 gulden to the reichsmark, the incorporation of Bohemia-Moravia in a reich customs union with the lifting of all exchange restrictions and the free exchange of money at ten Czech crowns per reichsmark, the signing of a clearing agreement with France to cover all except special payments and the establishment of clearing arrangements centring the trade of Italy, Yugoslavia, Greece, Finland, Norway, Sweden, Switzerland, Holland and Belgium with non-German countries through the *Deutsche Verrechnungskasse*.

The general intensification of exchange control may be illustrated by developments in four countries. Rumania in a decree of March 3 abolished the free exchange bourse and established a new official rate for all free exchange. (*See* table on p. 274.) Turkey attempted to regularize her extremely complex trading arrangements by decreeing that all trade with countries not making payment in free exchange would be subject to clearing, all trade with free exchange countries subject to uniform exchange premia (compensation trade). The official exchange rate, which was at $0.71 at the end of June, was raised by the end of September to $0.75. Even Switzerland introduced mild measures of control. A gentlemen's agreement between the Swiss National bank and other Swiss banks limited the use of foreign exchange to imports, while the transfer of foreign funds (excepting those of foreign banks) deposited after May 10 was made subject to the approval of the National bank. In Sweden, the foreign exchange law of June 7, 1939 establishing exchange control became effective from Feb. 26, substituting formal for informal controls. Foreign exchange was made available only for specified (chiefly commercial) purposes, the transfer of kronor to foreign accounts was restricted, balances other than demand deposits were blocked and the import or export of bank notes was prohibited except under licence.

Western Hemisphere.—In the western hemisphere Canada was by no means the only nation to adopt controls. Even the United States, through the limited use of export licences and the subjection of the blocked balances of the invaded countries to executive order, moved gradually in this direction. But it was in the Latin American countries, to whom the loss of markets subsequent to German conquests in Europe was a serious blow, that extension of exchange regulation was most rapid. Chile—which even at the beginning of 1940, in common with many of her sister nations, rigorously allocated available exchange to one of several distinct markets—by steps taken in July and September removed upwards of $2,000,000 from the export draft market by

Average Value of Foreign Currencies, December 1939 to November 1940.
(In United States cents per unit)

Country	Unit of Currency	1939 Dec.	1940 Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov
Europe													
Belgium	Belga	16.58	16.83	16.86	16.98	16.89	16.74	..	..	..	..	..	..
Bulgaria (Compensation)	Lev	00.88	00.88	00.88	00.88	00.88	00.88	00.88	00.88	00.88	00.88	00.95[1]	00.9
Denmark	Krone	19.30	19.30	19.31	19.31	19.31	..	..	..	..	..	..	..
Finland	Markka	1.81	1.82	1.71	1.53	1.77	1.90	1.98	1.96	1.97	1.96	1.97	1.9
France	Franc	2.23	2.25	2.25	2.13	2.00	1.85	2.01	..	..	..	..	..
Germany	Reichsmark	40.10	40.12	40.12	40.11	40.12	40.03	39.97	39.98	39.95	39.93	39.98	39.9
Greece	Drachma	00.72	00.72	00.72	00.70	00.65	00.63	00.65	00.67	00.66	00.66	00.66	..
Hungary	Pengö	17.60	17.59	17.61	17.59	17.59	17.58	17.59	18.48	19.37	19.37	19.36	19.5
Italy	Lira	5.05	5.05	5.05	5.05	5.05	5.04	5.04	5.03	5.03	5.04	5.04	5.0
Netherlands	Gulden	53.11	53.21	53.14	53.10	53.08	53.08	..	..	..	..	..	...
Norway	Krone	22.70	22.71	22.71	22.71	22.71	22.71	..	..	..	..	..	..
Portugal	Escudo	3.60	3.63	3.62	3.50	3.41	3.27	3.60	3.80	3.83	3.96	3.98	3.9
Rumania	Leu	00.71	00.69	..	00.47[2]	00.47	00.47	00.47	00.47	00.47	00.47	00.47	00.4
Spain	Peseta	9.95	9.95	9.95	9.81	9.14	9.13	9.13	9.13	9.13	9.13	9.13	9.1
Sweden	Krona	23.80	23.81	23.81	23.82	23.69	23.79	23.80	23.84	23.81	23.81	23.81	23.8
Switzerland	Franc	22.42	22.42	22.42	22.42	22.42	22.25	22.46	22.68	22.76	22.78	23.15	23.2
United Kingdom	£ Stl.												
(free)	.....	393.01	396.39	396.34	375.91	352.59	327.36	360.16	380.47	397.88	403.42	403.26	403.5
(official)	.....	403.50	403.50	403.50	403.50	403.50	403.50	403.50	403.50	403.50	403.50	403.50	403.5
Yugoslavia	Dinar	2.27	2.26	2.26	2.25	2.24	2.25	2.24	2.24	2.24	2.24	2.24	2.2
America													
Argentina	Peso												
(free)	.....	22.78	22.78	23.25	23.36	23.04	22.68	22.02	21.74	22.52	23.20	23.47	23.4
(official)	.....	29.77	29.77	29.77	29.77	29.77	29.77	29.77	29.77	29.77	29.77	29.77	29.7
Bolivia (free)	Boliviano	2.42	2.50	2.29	2.04	1.77	1.77	1.50	1.47	1.84	1.67	1.59	..
Brazil (free)	Milreis	5.03	5.01	5.02	5.03	5.03	5.02	5.03	5.03	5.02	5.01	5.02	5.0
Canada (free)	Can. $	87.62	88.02	86.65	82.88	84.24	80.97	80.07	86.92	86.87	85.47	86.32	86.9
Chile	Peso												
export	.....	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.0
official	.....	5.17	5.17	5.17	5.17	5.17	5.16	5.17	5.17	5.17	5.17	5.17	5.1
Colombia (official)	Peso oro	57.02	57.21	57.26	57.13	56.99	57.05	57.22	57.10	56.99	56.99	56.99	57.0
Cuba	Peso	88.00	90.00	92.00	90.00	88.00	90.00	90.00	90.00	88.00	90.00	91.00	91.0
Mexico	Peso	18.19	16.66	16.65	16.65	16.66	16.65	18.37	19.91	19.91	19.94	20.33	20.4
Peru (free)	Sol	17.36	19.01	18.05	17.64	17.24	15.97	15.38	15.38	15.38	15.38	15.38	15.3
Uruguay	Peso	36.46	36.36	37.47	38.84	39.09	38.60	37.71	35.96	34.94	36.37	37.63	38.0
Venezuela (free)	Bolivar	30.77	30.77	30.21	29.67	28.74	28.17	28.17	31.38[3]	31.38	31.38	31.38	..
Other													
Australia	£ Austr.												
(free)	.....	313.13	315.82	315.79	299.50	280.90	260.80	287.04	303.11	317.02	321.47	321.29	321.5
(official)	.....	..	..	..	..	322.80	322.80	322.80	322.80	322.80	322.80	322.80	322.8
British India	Rupee	30.03	30.14	30.16	30.18	30.20	30.12	30.11	30.15	30.13	30.16	30.17	30.1
British Malaya	Sing. $	46.10	46.48	46.48	46.75	47.14	47.12	47.11	47.11	47.12	47.10	47.10	47.1
China	Natl. $	7.49	7.83	7.01	6.41	5.99	5.08	5.76	6.05	5.48	5.21	5.68	5.8
Hongkong	H.K. $	24.48	24.63	24.57	23.25	21.83	20.23	22.39	23.58	22.51	22.62	23.08	23.4
Japan	Yen	23.44	23.44	23.44	23.44	23.44	23.44	23.43	23.43	23.43	23.43	23.43	23.4
New Zealand	£ N.Z.	315.03	317.09	317.06	300.72	282.05	261.87	288.19	304.32	318.25	322.74	322.55	322.8
Union South Africa	£ S.A.	397.41	397.86	398.00	398.00	398.00	398.00	398.00	398.00	398.00	398.00	398.00	398.0

[1]Bulgarian premium for payment of imports from the U.S. reduced on Oct. 15 from 35% to 25%. [2]Rumania: decree of March 3 abolished the free exchange bourse and est lished a new official rate for all free exchange equal to the old official rate plus 38% plus another 50%, which for the dollar is 211 lei to the dollar, or $00.47 per leu. [3]After June bank rate; Venezuelan free market abolished on that date.

authorizing the sale of exchange arising out of the export of ores and minerals at the "D.P." (nominally "free") rate of exchange. Purchase of an equivalent amount of import drafts at this higher rate was thus made obligatory. Colombia modified its exchange control system by granting increased powers to the Exchange Stabilization fund and further restricting the uses of exchange. Ecuador, hitherto without controls, introduced regulation in June, when the Central bank alone was authorized to conduct transactions in foreign exchange at an official exchange rate. After the invasion of western Europe, Peru called for and secured the voluntary limitation of sales of foreign exchange by the banks without being forced to adopt more strenuous measures.

Venezuela, after first tightening control measures so as to reduce the exchange made available for non-commercial payments, toward the end of June abolished the free market altogether and extended control to include all transactions. By the year's end, the only countries of Central and South America without formal exchange control were the following: Cuba, Dominican Republic, Guatemala, Haiti, Mexico, Panama, Peru, El Salvador. Even in most of these, considerable delay in the provision of dollars was frequent.

As for Latin American exchange rates, the generally increasing weakness until midyear reflected the steadily worsening position of their balances of payments resulting from the extension of the blockade to the invaded countries. Rates quoted on Brazil and Chile were steady all year owing to the exercise of controls. From July, the recovery of the Argentine "free" peso reflected a number of separate influences. In June, the $20,000,000 credit from the Export-Import bank was a strengthening factor; in the autumn, the converging effect of repressive measures against United States products, of a $100,000,000 British meat contract and of the inflow of large amounts of dollar funds and securit from the Balkan states and Switzerland, led to the appreciati of the free rate until by mid-October it was below the official ra Bolivia, with three rates of exchange extant—the controlled, t compensation and the curb rate—effectively checked and revers a sharp drop in the curb rate by a diversion of exchange all cations from the controlled market to the compensation mark an increase in the compensation rate from 53.4 bolivianos to t dollar to 70 and a contraction of credit. Rapid recovery of t curb rate permitted a reduction of the compensation rate in ea August to 58.

Between late July and Nov. 1940, Ecuador by successive redu tions brought her official rate of exchange down from 18 to sucres to the dollar, accompanying this action with a restricti of exchange allotments. The steadiness, after June, of the Per vian sol and the Venezuelan bolivar reflected, in the one case, t introduction of informal controls, in the second, the abolition the free market.

Mexico, with no exchange control other than the occasion limitation of the supply of dollars made available and official su port of the peso, experienced in Dec. 1939 a sharp increase in t demand for dollars, leading the Bank of Mexico to discontin its support to conserve its reserves. The peso-dollar rate rose fr 4.90 to 5.85 ($0.204 and $0.171) by mid-December, with dema still far exceeding supply. This lower rate for the peso was ma tained through May 1940 by the use of the stabilization fu and by credit restriction, after which it showed strong recove until the end of the year. A capital movement from the Unit States in June which increased exports to that country, togeth with the continuance of the aforementioned measures permitt the Bank of Mexico to lower its buying rate to 5 pesos per doll

luring June, after which it was able to allow the peso to seek its wn level.

The Orient.—In the orient, Japan's exchange control was mainained and during November strengthened considerably. Because f the sharp depreciation of sterling during May the yen-sterling ate was temporarily suspended, banks being allowed to fix their wn rates. Throughout 1940 the yen continued pegged to the ollar at 23.44 cents.

The support accorded the Shanghai yuan from mid-February vas abandoned at the end of May by the Anglo-Chinese stabiliza-ion committee, owing presumably to the continuing drain of ex-ess imports on the control funds. As a consequence, the yuan ropped during the week ending May 4 from $6\frac{1}{8}$ cents to $4\frac{7}{16}$ ents. Thereafter it fluctuated with the changing fortunes of rade until given strong support by American and British loans. (*See* EXCHANGE STABILIZATION FUNDS.)

The Netherlands Indies guilder entered the ranks of independnt currencies in May, following the collapse of the home country. dherence to the Allied exchange bloc, a rate of 1.875 to 1.895 uilders to the dollar, and abolition of the free sterling market vere announced. At first limited and later (July) complete exhange control measures were instituted. (*See* also GOLD RESERVES AND GOLD STANDARD.)

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xchange Equalization Account: *see* EXCHANGE STABILIATION FUNDS

xchange Rates: *see* EXCHANGE CONTROL AND EXCHANGE ATES.

xchange Stabilization Funds.

With all sterling area trade subject to a conolled official rate, the need for exchange stabilization operations y Great Britain disappeared. Thus the important British Exhange Equalization account was virtually inactive during most f 1940. Because of the existence of this controlled rate vis-a-vis ne sterling area and because of the disappearance from the exhange market (except for nominal quotations) of most European urrencies, the United States Exchange Stabilization fund also iscontinued its normal operations in European currencies.

In other directions, however, the use of the U.S. fund and of reources made available through the Export-Import bank (*q. v.*) ncreased. The stabilization fund early in Dec. 1940 advanced to rgentina and to China $50,000,000 each for currency stabiliza-ion. Out of the $500,000,000 made available on Sept. 26 to the Export-Import bank for loans to Latin American countries, $25,-00,000 was made available (October) to Brazil to cover exchange eeds for purchases in the United States on a revolving basis, 20,000,000 was advanced to Argentina in June for industrial and ransportation development and another $40,000,000 in December or currency stabilization, while Uruguay received a total of 7,500,000. China obtained $50,000,000 for purchases in the Jnited States, in addition to the stabilization loan. Great Britain imilarly divided a £10,000,000 loan to China equally between urrency support and purchases in the sterling area.

Canada's Exchange Equalization fund on May 1 took over at urrent market price all the gold and foreign exchange of the Bank of Canada and received in addition from that institution 325,000,000 from the sale of treasury notes and bills, for workng capital. With a controlled exchange rate and with the free ate eventually left to the forces of a constantly narrowing mar-et, operations of the fund assumed a rapidly declining signifiance.

The Swiss Exchange Equalization fund of 533,500,000 francs was liquidated on April 30, 1940 by a decree of the federal council, being divided between the federal government, the cantons and the national bank. Latin American stabilization funds and central bank resources were heavily drawn upon to support their currencies in the face of generally adverse balances of payments. Replenishment of these resources from U.S. loans, together with a restricted allocation of dollars and extended controls, prevented their exhaustion. (*See* also EXCHANGE CONTROL AND EXCHANGE RATES; GOLD RESERVES AND GOLD STANDARD.) (P. T. E.)

Exhibitions and Fairs: *see* FAIRS, EXHIBITIONS, EXPOSITIONS.

Exploration and Discovery.

Arctic. — In exploration and development of Arctic territories the work of the soviet union continued to exceed all others, both in extent and in variety. During 1940, work in large areas of the non-soviet Arctic was in abeyance because of war conditions. This was particularly the case with Greenland and the Canadian far north.

U.S.S.R.—One of the outstanding events of 1940 was the voyage of the icebreaker "Stalin," which headed north from Murmansk on Dec. 15, 1939, to assist in freeing the "Sedov" from the ice in which it had been drifting for more than two years. Passing west of Spitsbergen, the "Stalin" reached the "Sedov" in the Greenland sea on Jan. 13, 1940. The exact position of the meeting is not available, although it is known that on Dec. 27, 1939, the "Sedov" reported her position as 81° 34′ 6″ N. lat., 4° 40′ E. long. By heating the "Sedov's" hull and dynamiting the surrounding ice the vessel was freed, and on Jan. 16 the two ships started south. The "Sedov's" drift had lasted 812 days. After quick reconditioning at Murmansk, the "Sedov" again sailed for hydrographic work in the Kara sea.

During the "Sedov" drift scientific observations were carried on continuously. Preliminary reports show: the depth of the entire central portion of the polar basin is more than 13,000ft. and in places more than 16,000ft.—thus falling in line with the 15,367-ft. Stefansson (Storkerson) sounding of 1918, taken near 72° N. lat. north of eastern Alaska, and the 17,850-ft. Wilkins sounding taken in 1927 near 77° N. lat. north of Wrangel island, both of which soundings were at that time considered remarkable because of their excess over 12,631ft., the greatest depth observed by Nansen on the "Fram" drift of 1893–96. The temperature of Arctic waters has risen considerably between the "Sedov" and "Fram" drifts. The theory of a constant polar anticyclone is considered now disproved; for it is indicated that in summer reduced atmospheric pressure prevails throughout this region.

During the 1940 navigation season thousands of tons of freight were shipped via the northern sea route to the mouths of the great Siberian rivers, consigned to north Yakutai, Kolyma, Chukotka, the polar stations and ports situated along the route. This season, because of difficult ice conditions, vessels from Murmansk and Archangel followed a new route, rounding Cape Zhelanya, the northern tip of Novaya Zemlya. Scouting by planes had shown the sea here ice-free, while farther south stretched nearly unbroken fields. Hydrographic investigations were conducted along the entire 7,000-mi. stretch of the northern sea route.

The use of planes to assist ships in navigation of the northern sea route was extended. During July, August and September aerial reconnaissance was carried out over the Kara, Laptev, east Siberian and Chukotsk seas. An outstanding achievement during 1940 was a flight from Tixie bay to the vicinity of the pole of inaccessibility (determined by Stefansson in 1920 as being near 84° N. lat., 160° W. long.). Another remarkable flight was from Dickson island to a point at 82° N., 83° E.

There was a continuation of soviet geological surveys, some of them specially directed toward discovering new coal and mineral deposits. An expedition on the Chukotsk peninsula surveyed fodder and land acreages with a view to establishing gardening and stock farms.

The broad program of scientific observations was continued at all the established polar stations, with emphasis on study of the upper atmosphere by radiosonde balloons. A number of temporary polar stations were established, chiefly for detailed study of ice conditions at points along the northern sea route.

Canada.—R.M.S. "Nascopie" made its annual patrol of the eastern Arctic, delivering supplies to government and Hudson's bay posts. In addition to the usual stops in Baffin island and elsewhere in the Canadian Arctic, the ship this year visited west Greenland, calling at Thule in the north and Godthaab, the capital. At Ivigtut 1,705 long tons of cryolite were loaded for Canada. Two new radio stations were established—CG5K at Clyde and CG5H at Pond's inlet; station CY7R was transferred from Wakeham bay to Sugluk. At Fort Ross on Bellot strait a new post office was opened which will handle all northwest passage mail.

Hudson's Bay company vessels continued carrying freight and personnel to the company's Arctic posts in the western Arctic. One ship, the "Fort Ross," carried freight from Tuktuk, in the eastern edge of the Mackenzie delta, along the coast to posts as far east as Parry river; other supply boats plied up and down the great northward-flowing rivers of Arctic Canada.

Gold mining in the Mackenzie and Yukon districts, N.W.T., was expected to show a considerable increase over 1939. A number of new mines were being developed; modern and more efficient methods were in use in an increasing number of the old ones.

With 1,700 reindeer born in 1940, Canada's herds in the Mackenzie river district of the western Arctic were 6,635 at the summer count, 1940. These have developed from 2,370 which reached the Mackenzie in 1935 after a drive from western Alaska. In 1938 the herd was divided and 950 animals were turned over to a graduate Eskimo herder who took them east to the Anderson river. In 1940 he had 1,600 head. In the autumn of 1940 a second Eskimo was to receive a herd of 800, driven 250 mi. overland from the main herd, east beyond the Anderson river to the Horton river district. Such herds are given to trained Eskimos under an agreement by which they eventually return to the Canadian government as many animals as they received, keeping the increase as their own property.

Greenland.—Danish sailings to Greenland in the spring of 1940 started later than usual, due to bad ice conditions. When Denmark was occupied by the Germans in April, two Grönlands Styrelse vessels were on their way to Greenland, as well as the cryolite company's "Julius Thomsen," all arriving safely. It was expected that these ships, cut off from the mother country, would be used for coastal navigation and perhaps for sailings to the United States and Canada. Communication between Denmark and Greenland was in 1940 maintained by radio.

On May 10, the U.S.C.G. "Comanche" sailed from New York carrying the first U.S. consular officials ever assigned to Greenland. These were James K. Penfield, consul, and George L. West, Jr., vice consul, who were to establish headquarters at Godthaab.

Early in June the steamer "Nascopie" made a special trip to Greenland, carrying the first Canadian consular officials to be appointed to that country—Kenneth P. Kirkwood, consul and A. E. Porsild, vice consul. The ship carried a cargo of supplies for the use of west Greenland residents who were cut off from their usual shipments from Denmark.

Governor Eske Brun of north Greenland, who headed a trade delegation, announced in New York on Sept. 20 that Greenland's material needs have been assured for 1941 as the result of new trade channels established with the United States and Canada.

Captain Robert A. Bartlett made his annual cruise in Arctic waters. Leaving New York June 20 the "Morrissey" went to Labrador and Greenland, proceeding through Smith sound, Kane basin, and Hall basin into Kennedy channel, the most northerly point reached on the trip—the first time a vessel had entered this area since Peary (and Bartlett) in 1906.

Alaska.—There was little change within Arctic Alaska during 1940, but there is prospect of considerable during 1941. Gold mining was somewhat revived in Arctic camps as in the rest of Alaska, a continuing effect of what Alaskans call "the rise in the price of gold"—the devaluation of the dollar. There were in 1940 tentative plans for half a dozen or more air bases north of the Arctic circle. One may be constructed during 1941 near Point Barrow and perhaps others somewhere between Barrow and Kotzebue. Extensive developments in the air services of sub-Arctic Alaska also threw further tentacles beyond the circle.

In 1940 the United States weather bureau had five stations north of the Arctic circle; while none of these was established during 1940, the number of observations at each was increased and changed as follows: Wiseman, Kotzebue, Barrow increased from two observations daily to hourly observations between 5.30 A.M. and 5.30 P.M., 150th meridian time. Shungak, Point Hope changed from co-operative stations rendering observations on request to paid stations furnishing three scheduled observations daily. In Sept. 1940 the Barrow station was changed to a "first order" station by assignment of two weather bureau experts to take daily upper air soundings and to secure data on humidity, temperature, pressure, wind velocity and direction at various levels above the earth's surface, providing material aid to forecasting weather changes at Alaskan points. At Fort Yukon and Alatna, twice-daily airway weather reports were furnished in 1940. South of the circle the weather bureau had at the end of 1940 21 additional stations located at strategic Alaskan points, furnishing hourly reports during the period 5.00 A.M. to 5.00 P.M., 150th meridian time, and 14 other stations furnishing reports every three hours over the same period. Radiosonde observations similar to those made at Barrow were also made daily at Anchorage, Bethel, Fairbanks, Juneau, Ketchikan and Nome.

The Alaskan branch of the U.S. Geological survey did aerial photography for cartographic purposes covering part of the Porcupine valley and some of the tributary valleys from the south. A map was prepared for early 1941 publication. The chief Alaskan geologist, Philip S. Smith, and several of his staff did extensive work during the summer in sub-Arctic Alaska, chiefly mapping and general investigation of mineral resources, including "defence" minerals. A favourable sub-Arctic Alaskan development was that the defence program called for increasing farm, dairy, garden, chicken ranch and similar production. An unfavourable development was that Japan renounced her sealing treaties, which was interpreted to mean that more seals would be killed by them over wider areas through a longer season, resulting in a serious decrease of the seal population and corresponding decrease of Alaska revenues.

Antarctic.—The only Antarctic exploratory work in 1940 was that of the expedition of the United States Antarctic service. As planned, two bases were established—west base near lat. 78° S., long. 163° 35′ W. (about 4 mi. northeast of the site of "Little America"); and east base near lat. 68° 10′ S., long. 67° W. (on a small island in Neny fjord, Marguerite bay, Palmer peninsula). West base had 29 men under the leadership of Paul A. Siple, as well as the "Snow Cruiser" with a complement of 4 under Alton Wade; east base had 26 men under Richard B. Black.

Between Jan. 11 and Nov. 1 a considerable part of the exploratory program had been completed, and work was proceeding

Above: THE "NORTH STAR," supply ship of the U.S. Antarctic expedition, anchored in Marguerite bay in March 1940

Left: "DOG TOWN" at the east base camp of the U.S. Antarctic expedition in 1940

Below: THE U.S. ANTARCTIC EXPEDITION under Rear Admiral Richard E. Byrd raised the American flag over an island in Marguerite bay, near Palmer peninsula, in 1940 and established a base for further exploration of unknown territory

elow: THE SOVIET ICEBREAKER "Georgi Sedov," which set out in July 1937 explore a possible 12-month Arctic sea lane, was finally reached Jan. 13, 1940 the icebreaker "Joseph Stalin" (foreground) after 27 months in a drifting e jam. In Feb. 1939 the "Sedov" drifted closer to the north pole than any ip had ever been

Highlights of reported accomplishments are: one to four flights in each of the following localities—Marie Byrd land, Ross barrier, Pacific quadrant, Palmer peninsula. The Pacific quadrant flights, Feb. 24, 25 and 27, achieved the major objective of the expedition, the delineation of the unknown coast between 80° and 150° W. longitude. More than 450 mi. of new coastline was charted; also two large islands, three high mountain ranges and a huge bay. Work has been carried on continuously in glaciology, biology, geology, physiology, geophysics, radio, meteorology, cosmic ray.

Congress decided that, in view of the existing national emergency, expedition activities shall be suspended after the 1941 season's operations, and the bases evacuated. Two ships, the U.S.S. "Bear" and the U.S.M.S. "North Star," were (Jan. 1941) enroute to the Antarctic for the evacuation. It is anticipated that this will be accomplished and the ships returned to the U.S. by April 15, 1941.

Whaling.—Whaling in the Antarctic was disorganized by the European war, and little information concerning such operations was available because of disrupted communications.

From the little that is known it is apparent, however, that, of the several nations which formerly engaged on a large scale in Antarctic whaling, the Japanese were the only ones who remained in the field. The largest whaling fleet, the Norwegian, was still in the south at the time of the German occupation of Norway, and its ships were scattered and tied up in neutral ports. The German whalers were held in Hamburg by the British blockade. No British whalers were in the field in 1940, for there was a two-year reserve of whale oil in Britain when the European war started in 1939, and there were in 1940 large quantities in storage in the United States.

In the past the Japanese government has refused to adhere to the international conservation rules. It is, therefore, feared by those interested in the conservation of Antarctic whales that in 1940 the Japanese whaling fleet, consisting of 6 factory ships and 48 attendant boats, made serious inroads upon the whale population, and would so continue in 1941. (*See* NATIONAL GEOGRAPHIC SOCIETY.) (V. S.)

Export-Import Bank of Washington.

The Export-Import Bank of Washington was established Feb. 12, 1934, pursuant to executive order. Its capital stock was $75,000,000, consisting of $1,000,000 of common stock and $74,000,000 of preferred stock. The secretary of state and the secretary of commerce were authorized to subscribe to the common stock of the bank with funds obtained from the appropriations made by the Fourth Deficiency act. The Reconstruction Finance corporation purchased the preferred stock. Subsequent legislation continued the bank as an agency of the United States governme until Jan. 22, 1947, or such earlier date as may be fixed by t president by executive order.

The bank may have outstanding at any one time loans or oth obligations up to $700,000,000. Its governing body is a boa of trustees consisting of 11 members, representing the state d partment, treasury department, department of commerce, d partment of agriculture and the Reconstruction Finance corpor tion.

The purpose of the bank is to facilitate and to aid in financi exports and imports between the United States and any of territories and insular possessions and foreign countries. furtherance of said object and purpose the bank is authorized do a general banking business.

The bank has extended credits to various European countri to China and to South American and Central American countri These agricultural countries of South America and Central Ame ica lost their European markets because of the war. The ba therefore extended credits to the majority of the South Americ and Central American countries to assist them in the develo ment of their resources, the stabilization of their economi the orderly marketing of their products and in some cases for t construction of vitally needed highways and public works projec Substantial parts of these loans were used to purchase Americ machinery, equipment and supplies and to cover cost of engine ing. On Dec. 31, 1940, $131,031,867 were outstanding in loa and commitments totalling about $654,000,000 had been ma since the establishment of the bank. (W. L. PI.)

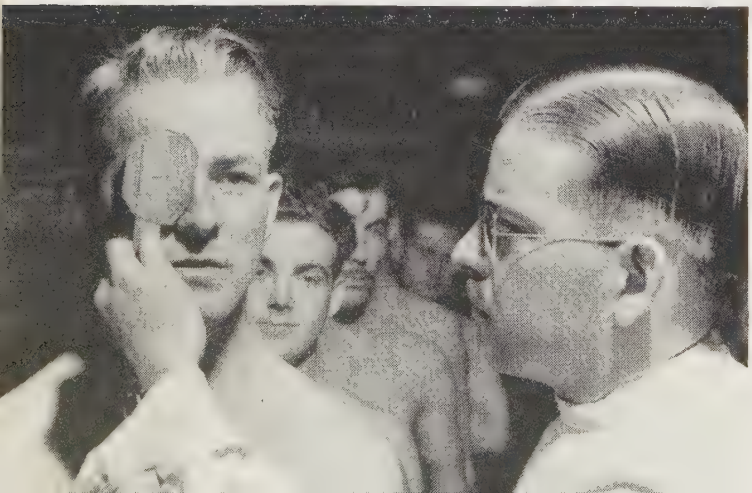
Exports and Imports: *see* INTERNATIONAL TRADE.

Eyde, Samuel (1866–1940), Norwegian chemist, was b on Oct. 29 and was educated at the Univers of Charlottenburg. After following his profession of engineeri for some time he began hydro-electric experiments in 1898. F years later, with the assistance of an associate, he invented method of extracting nitrogen from the air. In 1905 he found a hydro-electric trust which for years dominated the nitrate bu ness of Norway. From 1920 to 1923 he was the Norweg minister to Poland. His death at Asgardstrand, Norway, was a nounced by the official German news agency in Berlin on June

Eye, Diseases of. Vitamin Therapy.—The vitamins increasingly important in ophthalm therapeutics. Vitamin A has long been known to be connec with vision, a deficiency leading to a type of night blindness. Te ing the light threshold by measuring the minimum amount of li which can be seen after the eyes have been subjected to a light known brightness for a definite time gives a means of estimat the amount of vitamin A available in the retina of the eye. T test can be made by using a sensitive instrument known a photometer. A high threshold indicates partial night blindne presumably due to deficiency of vitamin A in the blood. A gr of persons with asthenopia or symptoms of eyestrain persist after correction of refractive errors showed a definite raising the light threshold. Following oral administration of large d of vitamin A, 79% of them obtained complete, and 12% part relief from their symptoms.

Curiously enough, deficiency of another vitamin, riboflavin B_2, which is in no known way connected with light percepti has been found to cause a similar symptom complex not relie by adjustment of refractive errors. This vitamin seems to req adequate hydrochloric acid in the gastric juices for proper util tion. Patients with adequate intake but with achlorhydria of develop signs of deficiency. Riboflavin deficiency is m

ALL U.S. ARMY VOLUNTEERS and conscripts must pass a rigid eyesight test



ested by skin lesions such as fissures at the corners of the mouth, caly, greasy desquamation in the nasolabial folds as well as the lae of the nose and sometimes the nostrils, the forehead and he ears.

Associated with these are found early an engorgement of the mall blood vessels at the edge of the avascular cornea of the ye. As the condition progresses these vessels proliferate and nvade the cornea beneath its outer layer. Opacities in the superıcial layers of the cornea, and later opacities and vascularizaion in the deeper layers, may develop. These findings associated vith photophobia, dimness of vision, a burning sensation of the yes and visual fatigue are characteristic of ariboflavinosis. Oral dministration of riboflavin given with hydrochloric acid, if a leficiency of this exists, results in a prompt healing of the cular lesions and a subsidence of the symptoms.

Exophthalmos.—Exophthalmos or protrusion of one or both yeballs is frequently found in association with excessive function f the thyroid gland and with an increased basal metabolic rate f the body. The severest form of exophthalmos may be seen ollowing removal of the thyroid gland, even though the basal ıetabolic rate is normal or subnormal. A satisfactory explanaion of the production of exophthalmos in association with goitre ıas been lacking until recently. It appears that the changes are ıue not to the thyroid, but to the pituitary gland. The eyeball is ushed forward by an increase of fluid in the tissues of the rbit outside of the globe. This oedema and exophthalmos have een experimentally produced in guinea-pigs by the injection of n extract of the anterior lobe of the pituitary gland which is igh in thyroid-stimulating factor. This was true in normal uinea-pigs and in those in which the thyroid gland had been reıoved. It was more marked in the thyroidectomized animals.

This indicates that the same hormone that stimulates the hyroid gland causes the exophthalmos and not that it is caused y an overacting thyroid.

Sulphanilamide.—Gonorrhoeal ophthalmia is a serious eye ıfection most commonly seen in newborn babies, but also seen in lder children and adults. Years ago it was one of the most comıon causes of blindness. Since the custom of instilling nitrate of ilver in the eyes of newborns has become prevalent it has beome relatively rare. When it did occur it required weeks of ospitalization with constant nursing care. The final result was sually a scarred eye with impaired vision.

Sulphanilamide has been used with such success in this disease hat in most cases the infected eyes have been cured in a week or ess with relatively little scarring. The mode of action of sulhanilamide is not clear as it has little general antiseptic power vhen used locally, but seems to be specific for certain organisms. Vhen given internally it apparently interferes with the metabolsm of the infectious agent, thereby preventing its multiplication nd either allowing it to die or be overcome by the defence ıechanisms of the host.[1]

Experimental Transplants.—The success of many surgeons in ecent years in transplanting a section of cornea from one eye to nother brings to mind the work of Dr. Leon S. Stone of New Iaven, Conn. For several years he has been transplanting entire yes in the salamander with a resulting return of vision. He reıoves the eye and replaces it in the orbit of another salamander nd observes the changes which occur. The transplanted eye hows signs of a returning blood supply within 24 hours. The ctina of the eye begins to degenerate rapidly and is completely estroyed by the 25th day. However, the amphibians have emarkable powers of regeneration and in about six weeks a new etina has formed. This regenerative power, which is necessary for return of vision, is one which is lacking in mammals. Attempts at transplanting and reimplanting eyes in the lower mammals have been uniformly unsuccessful. A reimplanted eye existing for about four months, one-fourth its original size, has been Dr. Stone's best result in the white rat. (*See* also VITAMINS.)

[1]Recently it has been found that sulphapyridine is more effective in treatment of norrhoeal ophthalmia than is sulphanilamide.

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Facsimile Transmission: *see* RADIO, SCIENTIFIC DEVELOPMENTS OF; TELEGRAPHY.

Fair Labor Standards Act: *see* CHILD LABOUR.

Fairs, Exhibitions, Expositions.

In 1940 two major expositions were held in the United States of America, the Golden Gate exposition at San Francisco, Calif., and the New York world's fair in New York city, at which 62 nations distinguished themselves with their exhibits.

These two great expositions were first opened in 1939 and reopened again in 1940. They were being demolished at the close of 1940. The exposition in San Francisco was held on a manmade island of 400ac. in the centre of San Francisco bay. The site of the exposition was being prepared to become the metropolitan airport.

The San Francisco exposition closed with a total paid admission for the two years of approximately 17,000,000 people.

The New York fair reopened its gates in May 1940, again presenting an entirely different picture from the exposition in San Francisco, being much larger, covering 1,216ac., including parking areas and transportation facilities. The site was at Flushing Meadow park in the New York borough of Queens, Long Island. The site was a reclaimed swamp, which was at the close of 1940 being prepared for a public park. The New York world's fair of 1939 and 1940 closed its gates with a total paid admission for the two seasons of 44,932,978 people.

Both expositions had on view significant exhibits of art, San Francisco with its outstanding collection of Italian masters and New York with its masterpieces of art, valued at $30,000,000. (L. SK.)

Falk Foundation, The Maurice and Laura,

Pittsburgh, under its policy of devoting its resources to financing research studies of the factors affecting American industry, trade and finance, devoted 1940 chiefly to the completion of research studies for which grants had been made in earlier years and to the publication of their findings. The extension of the foundation's research program during 1940 consisted of a grant of $42,500 to the Brookings institution, Washington, D.C., for a study of public relief in the United States. This study is designed to evaluate the present public relief policies and to appraise their administration, to the end of designing a program which will meet the relief problem adequately, but more economically. Studies completed and published during 1940 included: *Productivity, Wages and National Income*, at a cost of $47,000; *Government and Economic Life* (vols. I and II), for which a grant of $100,000 was made; and *Wartime Control of Prices*, under an appropriation of $13,000. all of which were made by the Brookings insti-

tution; and *The Output of Manufacturing Industries, 1899–1937*, the first segment of a study entitled *Production and Productivity of Manufacturing and Nonmanufacturing Industries in the United States*, for which $90,000 was appropriated to the National Bureau of Economic Research, New York. The foundation's grants for 1940 included an appropriation of $50,000 for the support of the Brookings institution's general research program and $10,000 to the Carnegie Institute of Technology, Pittsburgh, for the annual support of the Maurice Falk Professorship of Social Relations, pending payment of the foundation's $300,000 endowment-grant for the professorship. (J. S. G.)

Falkland Islands: *see* British Empire.
"Fantasia": *see* Dance; Motion Pictures.
Farm Credit Administration: *see* Farmers' Co-operatives; Farm Mortgages; Federal Land Banks.

Farmers' Co-operatives.

Growers' co-operative cotton gins led the list in new kinds of co-operative enterprises in 1940 in the United States. That fact is noted prominently in its review of farm co-operative activities in 1940 by the co-operative research and service division of the Farm Credit administration. The FCA, in addition to supervising government loans to farmers and co-operatives, maintains services for improving co-operative enterprises. Although less than 4% in number, co-operative cotton gins gin about 10% of U.S. cotton, says the FCA. Among other newer developments are 29 co-operative egg auctions in 11 states, all but two being owned by producers. The first co-operative egg auction was established in New Jersey in 1930. There were, in 1940, 68 co-operative fruit and vegetable auctions held regularly at rural points. Approximately half of them were owned by growers. Co-operative livestock auctions numbered about 1,300 but only a small proportion were owned by farmers. Active farm co-operatives engaged in marketing and in dealing in farmer supplies numbered in 1940 about 10,700, with 3,300,000 members, reported the FCA review. In addition there were 1,900 mutual fire insurance companies, 2,000 mutual irrigation companies and 600 farm associations that supplied electricity on a co-operative basis. The total number of farm co-operatives in the United States was in 1940 about 15,500. Government loans to farm co-operatives, in the fiscal year ending June 30, 1940, totalled $81,273,693 and were divided among the following three agencies: federal intermediate credit banks, $897,190; banks for co-operatives, $62,176,819; Agricultural Marketing act revolving fund, $18,199,684. (S. O. R.)

Farm Income.

Total cash income of United States farmers in 1940 was about $9,050,000,000 to $9,075,000,000 as estimated in Dec. 1940, by the bureau of agricultural economics of the department of agriculture. This is approximately $700,000,000 over United States farmers' income of 1939 and is the second highest since 1930. The high of the decade was $9,100,000,000 in 1937. Cash income is made up of money received from farm products sold and from payments to farmers from the federal government. It does not include products consumed on the farm. Government payments run approximately between $500,000,000 and $750,000,000 annually. Sale of livestock rather than crops was responsible for the larger part of the gain in farm income in 1940. Industrial improvement growing out of the national defence program and other activities caused by the war in Europe was reflected during 1940 by a gradually increasing demand for farm products in the United States, despite a steady downward trend in exports of food and other agricultural products. The industrial improvement, which by October had reached a new all-time high (127% of the 1935–39 averages)

Income from U.S. Farm Products and from Government Payments to Farmers, First 11 months of 1940 and 1939

	1940	1939
Total income from farm marketings	$7,562,000,000	$7,001,000,000
From all crops	3,168,000,000	2,908,000,000
From grains	913,000,000	795,000,000
From cotton and cottonseed	587,000,000	532,000,000
Fruits	400,000,000	390,000,000
Vegetables	591,000,000	549,000,000
Tobacco	206,000,000	222,000,000
All livestock	4,394,000,000	4,093,000,000
Meat animals	2,204,000,000	2,071,000,000
Dairy products	1,376,000,000	1,243,000,000
Poultry and eggs	667,000,000	652,000,000
Government payments	696,000,000	716,000,000
Total, including government payments	8,258,000,000	7,717,000,000

was also reflected in higher costs for farm labour as men left farm employment for that of industrial centres. The U.S. cash farm labour bill increased during 1940 for the first time since 1937. Cash income received by United States farmers for the first 11 months of 1940 and 1939 was estimated, respectively, as $8,258,000,000 and $7,717,000,000. Of this amount $696,000,000 of government payments were received in 1940 and $716,000,000 of government payments received in 1939. The table shows the estimated income received for farm products for the first 11 months of 1940 and 1939. (S. O. R.)

Farm Machinery.

Manufacture and sale of farm machinery in the United States in 1940 exceeded 1939 by substantial margins that may top the record year of 1937 when $507,000,000 of farm machinery was sold at home and abroad. In 1939 total sales were $479,000,000, of which $410,000,000 was domestic and $61,000,000 export. Exports, largely to Canada, the first six months in 1940 were 24% above the same period in 1939, or $43,400,000 in 1940 and $34,900,000 in 1939. Total exports in 1940 probably reached upward of $87,000,000, as estimated by Harry G. Davis, director of research of the Farm Equipment institute, in an address before the 47th annual convention of the institute Oct. 3, 1940. Wholesale sales by the industry in the five-year period of 1935–39, Mr. Davis said, averaged $461,000,000, of which $408,000,000 were sold for use in the United States and $53,000,000 abroad. An entirely new type of machine and process for harvesting and utilizing hay represented the most significant technological advance in the farm machinery industry in 1940. For 40 years there has not been a fundamental change in haying equipment, while other farm machinery has increased in both efficiency and economy of operation. The same amount of labour and the same wasteful methods are represented today in haying as at the beginning of the century. Several implement manufacturers are developing a new machine designed to mow the standing hay, chop it up and dump it into trailing wagons which carry it to silos where it is mixed with molasses, ground corn,

Tractors on U.S. Farms by States, July 1, 1940

Illinois	156,347	Washington	15,111
Iowa	141,774	Virginia	15,014
Texas	113,613	Tennessee	14,368
Kansas	103,827	New Jersey	14,228
Minnesota	95,552	Kentucky	14,051
Ohio	94,598	Maryland	13,910
Indiana	93,759	Louisiana	13,427
Wisconsin	86,315	Alabama	11,782
Nebraska	75,355	Florida	11,7[illegible]
California	72,291	Idaho	10,330
New York	67,858	Massachusetts	7,115
Michigan	66,399	South Carolina	7,03[illegible]
Pennsylvania	59,409	Wyoming	6,02[illegible]
Missouri	56,034	Arizona	5,628
North Dakota	54,883	Maine	5,57[illegible]
South Dakota	50,446	New Mexico	5,49[illegible]
Oklahoma	49,974	Connecticut	5,060
Montana	24,801	West Virginia	4,47[illegible]
North Carolina	22,603	Vermont	3,93[illegible]
Colorado	19,141	Delaware	3,900
Mississippi	16,703	Utah	3,010
Arkansas	15,560	New Hampshire	1,94[illegible]
Georgia	15,545	Rhode Island	1,14[illegible]
Oregon	15,184	Nevada	57[illegible]

(Estimated by *Implement and Tractor.*)

acid or other fermenting agent and stored as green silage. If the hay is cut and cured in the field the machine picks it up, chops it and dumps it into trailing wagons which transport it to the barn. Chopped hay requires one-third to one-half as much storage space as unchopped hay. The number of tractors on U.S. farms in 1940 was estimated by *Implement and Tractor,* Kansas City, Mo., as 1,762,795, as of July 1, 1940. The number in 1939 was estimated by *Farm Implement News,* Chicago, as 1,625,820, as of April 1. The table shows tractors on U.S. farms July 1, 1940, by states, as estimated by *Implement and Tractor.*

(S. O. R.)

Farm Mortgages. Operations of one of the principal farm loan agencies, the federal land bank commissioner, were extended by act of Congress in 1940 to June 1, 1942. The land bank commissioner makes loans to farmers on first and second mortgages to purchase farms, to refinance outstanding loans and for other agricultural purposes. Generally such loans are to farmers ineligible to borrow under the more rigid requirements of the 12 federal land banks. Land bank commissioner loans to farmers outstanding at the close of the fiscal year ending June 30, 1940, numbered 433,706 and totalled $668,850,213, the Farm Credit administration reported. Farm mortgage loans of the federal land banks outstanding on the same date numbered 616,308 and totalled $1,880,408,005. These two government agencies held about 40% of the total of farm mortgages in 1940. Farm mortgages held by the now remaining joint stock land banks, June 30, 1940, numbered 16,743, for a total amount of $57,334,169. On that date 31 joint stock land banks were in operation, four were in voluntary liquidation and six were in receivership. Formerly there were 88 joint stock land banks, which were private corporations organized under the Farm Loan act of 1916. Under the Emergency Farm Mortgage act of 1933 the joint stock land banks were forbidden to make further loans, except renewals, and have since been in a process of withdrawing from business. They had made a combined total of 130,728 farm mortgage loans for $903,194,063. The Farm Credit administration (FCA), which directs the governmental farm lending agencies, was a separate organization until 1939 when it became a part of the department of agriculture. Proposed new legislation in congress in 1940, affecting farm loans, involved two conflicting viewpoints. One contended that the Farm Credit administration be maintained apart from the department of agriculture. The other, as expressed in the Jones bill, advocated that the department of agriculture extend farm credit on still more liberal terms than had been done heretofore. The Jones bill was successfully opposed by the American Farm bureau, the Grange and other farm organizations and by the American Bankers association. Farm mortgages outstanding in 1940 in the hands of governmental and private agencies totalled about $7,000,000,000, a comparatively small decrease from the $7,071,000,000 total of 1939. The peak of farm mortgage debt was $10,751,000,000 in 1923. For details of other farm credit operations *see* FARMERS' CO-OPERATIVES and FARM TENANCY.

(S. O. R.)

Farm Security Administration: *see* FARM TENANCY; HOUSING; MEDICINE: *Socialized Medicine.*

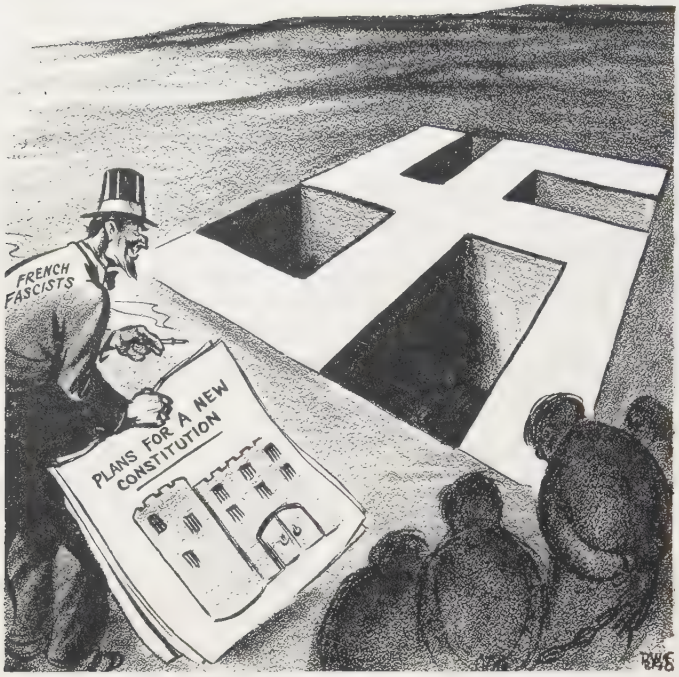
Farm Tenancy. Four of every 10 farm families in the U.S. are tenants and the number is increasing by about 40,000 a year, reports the *Agricultural Situation,* monthly publication of the U.S. department of agriculture. In efforts to combat the growing tenancy the Federal Farm Security administration ended, on June 30, 1940, the third year (1937–40) of the tenant purchase program it is conducting and in which it made loans to 13,000 tenant farmers in 1,300 counties to buy farms. Of these loans $38,000,000 was lent to 7,000 farmers, approximately, in the fiscal year ending in 1940; in 1938–39, $25,000,000 and in 1937–38, the first year of the program, $10,000,000. Average of loans varied slightly in different years but was $5,400 for the three years (1937–40). There were 133,000 applications for loans in 1940. Those eligible for loans are farm tenants, share croppers and farm labourers. Under supervision of the Farm Security administration local farmers' committees select the persons to whom loans are made and approve the farm to be purchased. Family-size farms are selected and the loan covers the cost of the land and putting farm buildings in repair. Loans are allocated among the states according to farm population and proportionate tenancy. Tenants obtaining loans co-operate with the FSA supervisors in adopting a "farm and home plan" which provides for home production of food and livestock feed and two products for sale. From July 1, 1935 to June 30, 1940 the Farm Security administration made rehabilitation loans of $376,476,000 to 559,000 farm families. To some of these and to 546,000 additional farm families, the FSA made grants of $112,531,000, chiefly in areas devastated by floods or drought. (*See* also FARM MORTGAGES.)

(S. O. R.)

Fascism is the name for a political philosophy which puts the nation-state or the racial group, its power and domination, into the centre of life and history. It disregards completely individuality and individual rights as well as mankind and humanitarian claims, in the exclusive interest of the national collectivity and its increase of might. As a political technique it aims at the exclusive existence of a single party which identifies itself with the state and makes it subservient to its aims. Under its guidance the whole nation is strictly regimented politically, economically and culturally; its organization is modelled after the army, with stern insistence upon hierarchy, authority and obedience. Fascism denies the equality of individuals or races, disbelieves in international co-operation and extols the sacred egoism of the nation. Its insistence upon the right of the stronger, its disregard for universally binding international law and for reciprocity and equal rights of peoples were responsible for the international anarchy characteristic of the '30s in the 20th century.

From 1936 on, the leading fascist powers, Germany, Italy and

"SHE SAYS, 'I DO,'" declares Pétain in this English attack on France's "voluntary" transformation into a semifascist nation July 10, 1940. The cartoon is by Whitelaw in the *London Daily Herald*



A READY-MADE "FOUNDATION for a New Bastille" was France's constitution of 1940 as seen by Bishop in the *St. Louis Star-Times*

Japan, co-operated closely politically, economically and diplomatically. Their anti-Comintern pact of 1937 served as an instrument for their joint battle against communism and against democracy. That this pact was above all an opportunist attempt to secure world control to the detriment of the western democracies, especially Great Britain and the United States, was made clear when Germany concluded in Aug. 1939 a pact of friendship and nonaggression with the soviet union. The anti-Comintern pact was quietly allowed to recede into the background, but it was replaced by a formal alliance among the same three leading fascist powers when on Sept. 27, 1940, in Berlin, Germany, Italy and Japan united for the purpose of their common struggle to establish a new world order. While formerly fascism had tried to sell itself to certain conservative and capitalistic circles in the democracies as a bulwark for conservatism against social revolution and communism, it now proclaimed itself the great social and revolutionary force which would end the reactionary and conservative "pluto-democratic order" and establish a new order, primarily in Europe and Africa under German and Italian leadership, and in eastern Asia under Japanese leadership, but an order which was destined to become the common new order of mankind.

The effort to broaden the base of the new order by the adhesion of other nations, although announced with great insistence in the fall of 1940, failed. Only three minor vassal states or protectorates of Germany, Slovakia, Hungary and Rumania, signed the pact. It became clear that the new order was not to be based upon the voluntary collaboration of free and equal peoples, but was to be strictly of a hierarchical nature with the German and the Japanese races dominating and guiding the weaker or so-called inferior races, which were to be disarmed and made economically subservient to the leading races. By her conquests, Germany succeeded in introducing fascist conceptions into the conquered countries, Norway, the Netherlands, Belgium and France, but with the exception of France where the defeat offered to some native groups (long hostile to the French Revolution and its principles of liberty, equality and fraternity) the opportunity of seizing power, the attempted fascistization met with the stubborn resistance of the majority of the conquered peoples. The continued resistance of the British democracy and the defeat of the fascist Italian forces by Greece, as well as the successful organization of Chinese democracy in its struggle against Japan, had by the end of 1940 created a situation in which the so-called new order was existent only in so far as German or Japanese armies imposed it by their presence. Rumania, which had been a semifascist country for several years, joined the ranks of fascism openly when in the late fall of 1940 the Iron Guard or the Legion of the Archangel Michael seized power and established a so-called legionary state which began its career by the assassination of a number of the leading conservative statesmen, generals, high officials and intellectuals of Rumania. In Norway at the end of September Major Vidkun Quisling was imposed by the German forces of occupation as the ruler of Norway, and with the help of his minister of propaganda, Gudbrand Lunde, he quickly copied all the methods of national socialism. The semifascist government in France under Marshal Pétain declared the belief in the equality of man and in government by the people as absurd and introduced the same anti-Semitic legislation as that prevailing in other fascist nations.

In Japan Prince Fumimaro Konoye formed in July a government, the task of which was the building of a new national structure according to the fascist model, in which the nation's total power would be regimented for the attainment of the domination of the far east. Under the influence of this fascist trend the Christian churches in Japan were expected to conform to Japanese nationalist and totalitarian ideals. A united party, the Imperial Rule Assistance association, was founded to carry through the building of the new structure of Japanese life. It held its first three-day session in Tokyo in Dec. 1940, when the chairman of the meeting stressed the unity of Japan with Germany and Italy in the decisive battle between the new fascist order and the democratic way of life.

The recognition of the true intentions of fascism, of its uncompromising hostility to democracy, of its ruthless scheming for the establishment of the world domination of the leading fascist powers, of its treatment of populations who had submitted or had not resisted sufficiently, brought about a more determined will to resistance on the part of the democracies. The role played by direct and indirect fascist propaganda, especially by native "fifth columns," in the disintegration of democratic countries and in the undermining of their will and ability to maintain their forms of life, aroused democratic vigilance, and strong measures were taken in the democratic countries to protect themselves against the fascist menace, both from within and from without. That was especially noticeable in the two Americas where the various fascist groups showed a united attitude in their anti-Semitic propaganda and in their insistence upon isolation and upon nonintervention in Europe and the far east to help the victims of fascist aggression. (*See* also ANTI-SEMITISM; COMMUNISM; DEMOCRACY; GERMANY; ITALY; JAPAN; MINORITIES; PACIFISM; RUMANIA; SPAIN.)

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Fashion and Dress. In 1940, world affairs had a tremendous influence on fashion, for in that year Paris, for centuries the great creator of fashion, fell to German conquerors and the fashion centre of the world switched to New York. Late in January, the American buyers made their last trip to Paris for the spring openings. They found there a city of black-outs and spring fashions marked by simplicity and practical details. The blue worn by the French air force was the chic colour. Many of the evening dresses had sporty shirtwaist tops over long, slim skirts. Some of the summer day silks feature

Left: MILITARY INSIGNIAS ornamented sleeves, belts, caps and bags. This gold eagle is embroidered on a corduroy suit designed by Hattie Carnegie

Right: IN 1940 girls wore pompadours and pompadour hats made to accommodate their hairdress. The hat was designed by Sally Victor, who took the idea from the bonnet of one of Brigham Young's wives

Above: AMERICAN DESIGNERS delved into American history for inspiration in 1940 and there was much talk of Indian fashions. Sally Victor did this hat in feathers

Below: VINYLITE SLIPPERS. This new transparent plastic was a fashion sensation of 1940

Left: KNIT AND CROCHETED CAPS came in during 1940, probably because of the fact that many women were knitting for soldiers. This cap is by the American designer Sally Victor

Below: TURBANS were worn both by day and evening in 1940 and were effective with the new straight slim dresses. The Persian exhibition in New York city inspired many of the colour schemes. This dress is from Henri Bendel

Below: THE SLIM LINE replaced the bouffant in evening dresses in 1940. The sarong dress at the left is by James J. Rothenberg and the jacketed evening dress is by Pattullo Modes. Both designs are American

Below: JET-TRIMMED EVENING DRESSES, suits and evening jackets were popular in 1940. This is one of the last dresses made before the fall of Paris. It is by Balenciaga, in mustard jersey with a black top

aprons, an idea that caught on in America and later developed into the pinafore dress which American girls took back to college in the fall. By summer, Paris was occupied and it became evident that America would have to create its own autumn fashions, with no help from the French. After the armistice was signed, some of the French designers returned to Paris and started work once more, but their creations never reached the outside world. London continued to export sweaters, woollens and leather goods across a perilous Atlantic—but a London battered by air raids could not supply fashion leadership. The first all-American openings in August were greeted by a blaze of publicity. Skirts crept up a bit, because American women like to show their famous American legs. In evening dresses the long, slim silhouette replaced the bouffant, and all the smartest evening dresses had covered shoulders or jackets, suitable for wartime entertainments. Many of these jackets were heavily trimmed with embroidery in silk, beads or paillettes, and the colours were largely inspired by the Persian exhibition that had been shown in New York in the spring. The combination of pink red, Persian blue and gold was repeated ad infinitum. Because practically everyone was knitting for the soldiers, knitted and crocheted hats were greatly worn. Colourful enamel shields or cockades bearing the allied colours were sold for the benefit of war charities and replaced jewels on suit lapels. The American eagle screeched from sleeves, hatbands and from the clasps of bags and belts. Some American designers made an effort to look back into American history for inspiration. There were big Indian feather hats, and shoes inspired by Indian moccasins. Mormon bonnets were patterned after the hats worn by Brigham Young's many wives. As the autumn progressed, leopard fur became the rage. The South Seas sarong was modified for evening wear.

GERMANY joined the race to become fashion centre of the world in 1940 after the fall of Paris. The picture shows a German-designed fall outfit with black drape dress and a matching coat with silver fox cuffs

A rough chinchilla wool was used for the jackets of suits and f long, fitted evening coats. Woollen dinner dresses were extreme popular, especially for country week ends. In 1940, too, t chemical laboratories made their contribution to fashion. Nyl stockings appeared in the shops and manufacturers could hard keep up with the demand. Vinylite, a new plastic, was used f slippers, transparent as Cinderella's famous glass ones. You girls began combing up their pompadours. What had been small curl or roll on top of the head now became a real pomp dour. The front hair was caught up and then pushed forwar the back hair fell straight to the shoulders with big, loose cu at the ends. Skullcaps and pompadour bonnets were made the hundreds to accommodate the new hair-do. There was so talk of false hair, false chignons and false braids. All in all, was a period of transition, as designers accustomed to copy we forced to stand on their own. It was also a year of colo Travellers were going to South America, and South America dancers were dancing in the night clubs in native costume Gaucho red, Inca pink, orange, green, purple crept into turba scarfs and accessories, and inspired all the designers to wild and wilder flights of fancy. (*See* also FURS.) (C. SN.)

Faversham, William (1868–1940), Anglo-American act whose original name was Jones, w born in London, Feb. 12. He was educated at Hillmartin colleg He first appeared on the stage in the Vaudeville theatre, Londo in 1885. He played in stock company for a while and went to t United States in 1887, appearing with Helen Hastings in *Pen a Ink,* an unsuccessful play which closed after two weeks at t Union Square theatre in New York city. By 1901 he had ma a place for himself and was starred. He at one time or anoth was leading man for Minnie Maddern Fiske, Maude Adams a Maxine Elliott. His last appearance on the stage was in *Tobac Road.* He spent the last years of his life in a home for actors Bay Shore, N.Y. He died April 7.

Federal Bureau of Investigation of the United Stat department of ju tice is charged with the duty of investigating violations of t laws of the United States, collecting evidence in cases in whic the United States is or may be a party in interest and perform ing other duties imposed upon it by law. By presidential dire tive, the FBI has jurisdiction over espionage, sabotage, neutra ity violations and related national defence matters.

During the fiscal year 1940, 5,605 convictions were secured cases investigated by special agents of the FBI. A total of 4,15 stolen automobiles transported in interstate commerce was r covered. Since the passage of the Federal Kidnapping law 1932, a total of 185 cases has been reported to the FBI, and Aug. 1, 1940, 183 had been completely solved. Bank robber reached its peak in 1932, and following the passage of the Fe eral Bank Robbery act in 1934, bank robberies have decline nearly 80%. In the year 1940, convictions were secured in mo than 96% of the cases investigated by the FBI when prosecute in court.

A total of 16,885 national defence matters was received du ing the fiscal year 1940 which required investigative activity. the request of the war and navy departments a program of su veying the protective facilities of manufacturing establishmen having large contracts to provide the government with defen material was inaugurated. During 1940, 270 plants were survey and recommendations designed to maintain a maximum of pr tection were made to the plant officials.

In 1924 the identification division of the FBI was founde with a nucleus of 810,000 finger-print records and on Aug.

940, more than 13,000,000 finger-print records were on file.)espite this growth, it is possible to identify an incoming set of npressions in three minutes. The civil identification section naintained for the insurance of personal identity of citizens numers nearly 2,000,000 finger-print records. Of the 7,097 examinaons involving more than 39,500 different specimens made by the echnical laboratory in 1940, 2,065 were for local authorities. The ost of operating the FBI in the fiscal year 1940 was $7,300,000 hile savings to the government, property recoveries and fines otalled $58,390,180.64 or a return of $8 for every $1 spent. (*See* so CRIME; KIDNAPPING; POLICE.)

(J. E. H.)

ederal Children's Bureau: *see* JUVENILE DELINQUENCY.

ederal Communications Commission: *see* PUBLIC UTILIES; RADIO, INDUSTRIAL ASPECTS OF; TELEVISION.

ederal Council of the Churches of hrist in America.

In 1940 the Protestant Episcopal Church, after having maintained a emiofficial relation with the council for many years, entered into ill membership. The constituent bodies of the council included 1940 most of the major Protestant bodies and one church Syrian Antiochian Orthodox) of the Eastern Catholic group. The otal constituency was slightly in excess of 22,000,000 comunicants.

The National Christian mission was launched with an itinerary overing 22 cities in 22 weeks, for the purpose of strengthening e spiritual foundations of American life. On Feb. 27–29 an terdenominational conference on the relation of the churches the international crisis was held in Philadelphia. In order provide an adequate religious ministry to the youth called nto training camps under the Selective Service act, President aul D. Moody of Middlebury college was secured as director f the general committee on army and navy chaplains. A special ommittee on the rights of conscientious objectors was created. program for relief of wartime suffering, including assistance European refugees, the Chinese and prisoners of war, was carled on jointly with the Foreign Missions conference.

Religious programs over national radio networks were presented t least once every day throughout the year. Interdenominational onferences on preparation for marriage and homemaking, on the elation of mental hygiene and religion, on public worship and n Christian social work were held in many local communities.

A plan for improving the service of Negro rural churches in everal southern states was undertaken. A program of public elations, designed to secure a wider interpretation of Christinity and the church to those sections of the population not eached directly by the normal processes of local churches, was egun. *Information Service* continued to be published weekly, resenting analyses of contemporary social problems.

At the biennial meeting of the council held at Atlantic City, J., Dec. 10–13, Dean Luther A. Weigle was elected president; ev. Dr. Albert Edward Day, vice-president. Rev. Dr. Samuel IcCrea Cavert is general secretary. (S. McC. C.)

ederal Crop Insurance Corporation: *see* CROP INURANCE.

ederal Home Loan Bank System

was created by act of U.S. conress approved July 22, 1932, to provide reserve credit facilities or thrift and home-financing institutions of the United States. is supervised by the federal home loan bank board composed of five members appointed by the president. The structure consists of 12 regional banks and their member institutions. The regional banks are located in Boston, New York, Pittsburgh, Winston-Salem, Cincinnati, Indianapolis, Chicago, Des Moines, Little Rock, Topeka, Portland and Los Angeles.

Institutions approved for membership must invest in the capital stock of their respective regional banks. The secretary of the treasury was also authorized to buy stock, and in 1940 the government owned approximately 74% of the aggregate stock of the regional banks. The banks obtain their funds, beyond their capital stock, through the sale of debentures and by accepting deposits from members. The funds of each bank are used mainly to make advances to members for the purpose of providing additional accommodations to local home owners and investors. Under certain conditions, advances for a short term may be obtained without the deposit of collateral. Long-term advances, which may run up to periods of ten years, must be secured by approved home mortgages or other acceptable collateral.

The bank system has experienced steady and rapid growth. On Jan. 1, 1933, it had but 101 members with estimated assets of $217,000,000. By Dec. 31, 1940, membership had increased to 3,864 of which 2,387 were state-chartered home-financing institutions, 1,437 federal savings and loan associations, 29 insurance companies and 11 savings banks; their combined assets were approximately $5,000,000,000. On the same date the paid-in stock of the bank system amounted to $169,281,650 and the consolidated assets of the banks came to $299,723,142. During 1940, institutions which were members of the bank system made about 40% of the new mortgage loans on urban homes made by all private institutional lenders throughout the United States.

To the extent that current needs for additional housing for national defence can be privately financed, the federal home loan banks and their member institutions by resources and experience are peculiarly equipped to make and service mortgage loans and thus under local supervision provide such housing for both temporary and future requirements as can be financed safely by private investments. In addition to their duties arising from the administration of the bank system and the supervision of federal savings and loan associations, the federal home loan bank board serves as the board of directors of the Home Owners' Loan corporation and also constitutes the board of trustees of the Federal Savings and Loan Insurance corporation. (J. H. FA.)

Federal Housing Administration: *see* BUILDING AND BUILDING INDUSTRY.

Federal Income Tax: *see* INCOME TAX; TAXATION.

Federal Land Banks.

The 12 federal land banks operating in the United States since 1917, under the Federal Farm Loan act of 1916 and subsequent legislation, make long-term first-mortgage loans on farms through 3,652 local co-operative lending institutions known as national farm loan associations. Since 1933 the land banks and the local associations have operated under the supervision of the Farm Credit administration which also supervises other federally-sponsored co-operative institutions providing short-term production credit and loans to farmers' co-operative business organizations.

Federal land bank loans outstanding on Dec. 31, 1940, aggregating $1,841,572,542, plus $646,659,778 of land bank commissioner loans made by the land banks as agents, represented 36% of the total farm mortgage debt of the country. Land bank commissioner loans, made on second as well as first mortgage security, were first authorized in 1933 for emergency financing, and cannot exceed $7,500 to any one farmer.

The total capital of the 12 federal land banks was $177,940,300

on Dec. 31, 1940, of which 62·1% was owned by national farm loan associations and individual farmers borrowing directly from the banks. The remaining amount was provided, and is owned by, the United States government. Funds for making loans are obtained primarily from the sale of farm loan bonds to the investing public. Farm loan bonds aggregating $1,755,151,540 were outstanding on Dec. 31, 1940.

On Jan. 1, 1941, federal land bank loans were being made to farmers through national farm loan associations, of which there were 3,635 on Dec. 31, 1940, at an interest rate of 4%, which is 1% above the rate at which the last preceding bond issue was sold. The rate of interest is temporarily reduced to all borrowers by act of congress.

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Federal Legislation: *see* LEGISLATION: *Federal.*

Federal Power Commission: *see* ELECTRICAL INDUSTRIES; PUBLIC UTILITIES.

Federal Reserve System.

International developments in 1940 had important repercussions on the banking system of the United States. The invasion of the Netherlands, Belgium, France and other countries necessitated the institution of direct control over bank balances in the United States belonging to certain foreign governments and their nationals, in order to prevent the liquidation of such funds under duress. As a result, over $1,000,000,000 of bank deposits, along with other foreign-owned assets in the United States, may be transferred only by authorization of the secretary of the treasury. Enormous amounts of gold continued as in years past to be shipped to the United States, the shipments in 1940 being largely occasioned by purchases, actual and anticipated, of war supplies. Most of this gold was sold to the United States government and increased bank reserves and bank deposits. Excess reserves of member banks of the federal reserve system increased still further during the year, and long-term interest rates fell to their lowest recorded levels. Foreign developments stimulated an increase in defence expenditures in the U.S., and this in turn led to a substantial increase in the volume of loans made by banks.

Partly on account of the rapid expansion of business activity which began in May, 1940, and the existence of nearly $7,000,000,000 of excess reserves, the federal reserve authorities submitted to congress a program designed to put the system in a position "to take measures, when necessary, to forestall the development of inflationary tendencies." The following is a summary of the program suggested for congressional consideration:

1. The system should be provided with such additional powers as would enable it to absorb a large part of existing excess reserves, as well as such additions as may occur.
2. The president's power to change the gold value of the dollar, as well as the treasury's authority to issue $3,000,000,000 of greenbacks and to issue silver certificates against foreign silver purchases, should be discontinued; this would remove three of the main sources of potential increase in excess reserves.
3. Means should be found to prevent a further growth in excess reserves and in bank deposits arising from future gold imports.
4. Government expenditures in excess of tax receipts should be financed by sales of government securities to individual investors rather than to the banks.
5. As the national income rises, an increasing part of defence expenditures should be met by tax revenues rather than by borrowing, with the ultimate objective of balancing the budget at the time when the country approaches a condition of full utilization of its economic capacity.

The monetary gold stock at the end of 1940 amounted to $22,000,000,000, an increase of more than $4,300,000,000 over that of Dec. 31, 1939. Gold held under earmark by the Federal Reserve Bank of New York for foreign account also increased by $642,000,000 and amounted to $1,800,000,000 at the year end. All but $150,000,000 of this increase in the monetary gold stock and in earmarked gold came from abroad. A large part of t gold inflow was attributable to a surplus of merchandise expo from this country of nearly $1,500,000,000 in 1940. Most of t remainder appears to have represented capital inflow, much which, however, could not be fully identified. Beginning in M the predominant factor in the reported—and possibly in the u reported—movement of capital was the official transfer of fun to the United States.

The government's acquisitions of $4,300,000,000 of gold, a also of $100,000,000 of silver, tended to produce a correspond increase in the reserves and deposit liabilities of commerc banks. However, the increase in bank reserves was less than t amount of such acquisitions on account of the increase of $ 100,000,000 in money in circulation and of the net sales $300,000,000 of securities by the federal reserve banks. Al it should be noted that the growth of nonmember bank reserv tended to reduce the reserves of member banks. As a result these and other offsetting factors the reserves of member ban rose only $2,400,000,000, as compared to the increase of ov $2,900,000,000 in 1939. Since only a part of the increased serves of member banks was required by law to be held agai their additional deposit liabilities, the remainder served to crease their "excess reserves," which rose to over $7,000,000,0 during the latter part of October. This increase in excess reserv contributed to a further reduction in medium- and long-te interest rates to their lowest recorded levels. In Dec. 1940 t average yield on treasury bonds of 12 or more years' matur was 1·89%, as compared to 2·35% in Dec. 1939, and on treasu notes of 3 to 5 years' maturity the yield was ·35%, as compar to ·51%. The yield on the highest grade corporate bonds av aged 2·71%, as compared to 2·94%.

After a decline in industrial activity during the first fo months of 1940, there was a sharp upturn beginning about Ma The board of governors' index of industrial production rose fro 111 in April to approximately 136 in December, with a furth increase in prospect. This increase in industrial activity fro May to December was accompanied by an increase of $620,00 000 in the commercial, industrial and agricultural loans of t weekly reporting member banks of the federal reserve system.

Commercial banks greatly increased their holdings of dire and guaranteed obligations of the United States during 194 Weekly reporting member banks alone added about $1,300,00 000 to their portfolios. The federal reserve banks, on the oth hand, reduced their holdings by about $300,000,000 to $2,20 000,000, which at the year end were less than at any time sin the autumn of 1933.

The open market operations of the federal reserve system ha been so timed as to moderate the movements of bond prices a have not been made with reference to their effect upon the volum of bank reserves. Early in May, when foreign developmen tended to depress the government bond market, the open mark committee purchased about $10,000,000 of government secu ties. This action was analogous to that taken in August a September in 1939, when about $470,000,000 of government s curities were purchased during the decline in bond prices short before and after the outbreak of war in Europe. During the la ter part of 1940, the federal open market committee sold go ernment securities as the market strengthened.

As a result chiefly of the government's large acquisitions gold and silver and of the increased holdings of government s curities by banks, bank deposits reached an all time peak. T amount of currency held by the public also increased, partly a result of increased business activity. Consequently, at t end of 1940, bank deposits, exclusive of inter-bank balances, all commercial and savings banks and currency outside the ban

mounted to about $70,000,000,000, which is approximately 25% reater than the highest pre-depression level. A large part of iis supply of money was idle, as was evidenced by the low rate f turnover. (*See* also BANKING.) (M. S. E.)

ederal Surplus Marketing Administration: *see* BUTER; MEAT; POTATOES.

ederated Malay States, area 27,540 sq.mi., population (1939) 2,125,274, are one of ie three main subdivisions of British Malaya, the others being ie Straits Settlements and the Unfederated Malay states (*qq.v.*). here are four Federated Malay states, Perak, Selangor, Negri embilan and Pahang, of which the first three are on the west oast of the long Malay peninsula, while Pahang is on the east oast. Each state is administered under the advice of a resident ho is subject to the instructions of the high commissioner, an ffice combined with that of governor of the Straits Settlements. Iigh Commissioner in 1940: Sir Thomas Shenton Whitelegge homas. The seat of the federal government is at Kuala Lumpur Selangor), the largest town in the states, with a population of 27,124. The Federated Malay states have 1,068mi. of railway nd 3,067mi. of roads. They constitute the immediate hinterland f the two great trading ports of Singapore and Penang and are ch in minerals and raw materials, of which the most important re tin and rubber. Secondary objects of production are gold, oal, tungsten, coco-nuts, oil-palms, rice and pineapples. Chinese ibour is largely employed in the tin mines and Indian in the rubber plantations. The indigenous population, the Malays, are engaged in agriculture, hunting and fishing, avoiding industrial work. he area under rubber amounts to 1,625,000ac. The revenue of ie states in 1938 was £7,356,197 and the expenditure £11,851,474. he public debt was £7,616,667. Imports in 1938 were £14,385,-04 and exports £20,986,985. Expenditure on education was 386,620. There were 569 Malay schools, with 56,969 pupils; 497 Chinese with 44,367 pupils; 12,863 boys and 5,440 girls went to Cnglish schools. In all, 2,661 vessels, with a total tonnage of ,589,101, cleared the ports in 1938. The unit of currency is the traits dollar, worth 47·51 cents U.S. in Dec. 1940. (W. H. CH.)

ederation of Labor, American: *see* AMERICAN FEDERAION OF LABOR.

eldspar. Almost the entire commercial utilization of the feldspars is in the ceramic and glass industries. he United States is the world's largest producer and consumer, ollowed by Sweden, China and Norway, with a number of inor producers. World production is of the order of 400,000 to 50,000 metric tons, of which the United States contributes nearly wo-thirds. The 1939 consumption of ground feldspar in the Inited States was 259,200 short tons, 4% of which was imported rom Canada, about 53% in glass, 34% in pottery, 11% in namel and sanitary ware, leaving 2% for miscellaneous uses, ost of which are of a ceramic character. (G. A. RO.)

encing. Fencing continues to make encouraging progress in the United States under the jurisdiction of the Amaeur Fencers League of America, an organization now in its 50th ear of existence. During 1940 five new divisions were added to ie organization, making a total of nearly 30 divisions, from New ork to Oregon, Texas on the south, and including Hawaii. Fencg also occupies a prominent place on the sports curriculum f colleges and schools.

Competition in the national championships of the A.F.L.A. was uch keener than ever before, leading to many exciting and tense

JOANNA DE TUSCAN, champion woman fencer of Detroit, Mich., in a 1940 bout

moments. A large contingent of Cuban fencers competed, adding considerable interest for both competitors and spectators. Dr. John R. Huffman, president of the league, who captured many individual and team titles during the past 20 years, accounted for the national three-weapon title, was third in the sabre championship, a member of the championship sabre team, and the three-weapon championship team. Dernell Avery led in the national foil championship; Fred Siebert displaced the capable Loyal Tingley in the épée event, and Norman C. Armitage took the sabre title.

The outstanding episode in the women's division of the league championships was the crowning of a new foil champion, Miss Helena Mrockowska, who has taken the place of Miss Helena Mayer, who held the title for a number of years. The women's foil team of the Salle Santelli was victorious. Miss Maria Cerra, of the Salle d'Armes Vince, former intercollegiate champion, won the Alice Wendt Voorhees open women's individual fencing medal against a field of 27. The league issued a new book, entitled *Fencing Rules,* with the co-operation of other fencing associations. (J. B. P.)

Fertilizers. During 1940 the war in Europe materially affected the production and consumption of fertilizer raw materials throughout the world.

Continental Europe in 1940 was unable to import its customary needs of phosphate rock from Africa and the United States and was unable to export freely its potash salts and nitrogen compounds to the western hemisphere and to other parts of the world. Britain was unable to obtain potash from the Continent and the scarcity of ships made difficult sufficient imports of phosphate rock, nitrate of soda and potash salts from her possessions and from the Americas.

Governmental orders in most of the belligerent countries either controlled the amount of plant food that might be used, or else specified the crops on which it might be used, or both. In most of these countries also strict price control of fertilizer materials was in effect in 1940. Censorship prevented the release of dependable statistical data concerning production and consumption within the warring nations.

At the beginning of the war in 1939, Germany was believed to have an annual nitrogen fixation capacity of 1,750,000 tons and was in 1940 believed to control additional capacities in overrun Norway, Belgium and Holland of 495,000 tons. Great Britain and Japan undoubtedly greatly increased their nitrogen production. The defence program of the United States also curtailed export of fertilizer materials from that country.

Contrary to its position in the 1914–18 period, the United

States was in 1940 completely self-sufficient within its own borders as to the quantity of nitrogen, phosphoric acid and potash used in agriculture. Deposits of phosphate rock surveyed were known to contain thousands of millions of tons and to be sufficient for thousands of years. In 1939 production of phosphate rock amounted to 3,987,970 tons. Rapidly expanding development of four large plants producing potash salts from substantial reserves might even permit export in quantity later. Production in 1939 reached 524,986 tons of salts containing 307,051 tons of actual potash (K_2O). In 1939 nitrogen came from by-product coke ovens in the form of sulphate of ammonia in the amount of 676,800 tons. In the same year, Chilean nitrate of soda was imported to the extent of 604,390 tons, and approximately 400,000 tons were manufactured synthetically from the air. Many kinds of nitrogen-bearing organic by-products such as tankage, dried blood and vegetable meals add to the nitrogen supply. Nine plants for the fixation of atmospheric nitrogen have an estimated capacity of 375,000 tons of nitrogen a year. Additional plants were under construction in 1940 in the defence program. (C. J. Br.)

Few, William Preston (1867–1940), U.S. educator, was born in Greenville, S.C., Dec. 29, and was graduated from Wofford college in 1889. He became professor of English in Trinity college at Durham, N.C. in 1896 and rose to the presidency in 1910. When this college became Duke university he continued as president. Dr. Few was a prominent Methodist layman. He died in Durham, Oct. 16.

Fiction: *see* American Literature; Canadian Literature; English Literature; French Literature; Italian Literature; Spanish-American Literature.

Fifth Column: *see* Anti-Semitism; Brazil; Defence, National; European War: *Destruction of the Low Countries;* Fascism; Germany; Greece; Hispanic America and the European War; Oklahoma; Propaganda; *see* also other countries of Central and South America.

Fiji: *see* Pacific Islands, British.

Financial Review. The year began with the subsidence of a premature war boom caused by the outbreak of war in Poland in Sept. 1939. It ended on the rising tide of a genuine war boom caused by British orders for American implements of war and by the U.S. defence program.

On the premature boom there was heavy forward buying of raw materials in expectation of large war orders. But the French and British governments were unexpectedly slow in placing orders, inventories piled up in factories, and the Conference board's index of new orders received by manufacturers fell from a high record of 178 (1935–39=100) in Sept. 1939, to 108 in March 1940. In order to prevent further rapid accumulation of inventories, manufacturers curtailed output in the first quarter of 1940. The federal reserve index of industrial production declined from 126 in Dec. 1939, to 111 in April 1940.

The Conference Board's Indexes of the Values of Manufacturers' New Orders, Shipments and Inventories
(1935–39=100; Seasonally Adjusted)

1939	Orders	Shipments	Inventories	1940	Orders	Shipments	Inventories
Jan.	96	98	102	Jan.	120	127	114
Feb.	98	97	102	Feb.	114	122	115
March	101	99	101	March	108	108	115
April	93	90	101	April	128	110	116
May	108	96	101	May	132	116	117
June	113	101	101	June	144	115	119
July	103	101	102	July	161	127	120
Aug.	109	107	102	Aug.	158	136	121
Sept.	178	119	102	Sept.	176	136	122
Oct.	141	125	103	Oct.	198	147	123
Nov.	133	131	107	Nov.	208	150	125
Dec.	121	129	111	Dec.	. .	. .	. .

In April and May the German invasions of Denmark, Norway, the Low Countries and finally France made Britain redouble its efforts to defeat Hitler. It became increasingly probable that the United States would be compelled to lend more active assistance to the British empire. U.S. manufacturers again revised upward their estimates of forthcoming demands on their facilities, and forward buying was resumed, as reflected in a renewed rise in the Conference board's index of new orders. From 108 in March the index advanced to a new high record of 208 in November.

In the second quarter orders for machine tools, aeroplanes, iron and steel and explosives began to pour in from Britain. The shipbuilding industry was already booming, owing to the combined effects of the maritime commission's merchant marine program, the naval expansion program authorized by congress in 1939, and the anticipation of a shortage of cargo ships with the intensification of the German effort to blockade the British Isles. The industries concerned with these essentials of modern mechanized warfare, however, constituted but a small fraction of U.S. industry; and, despite record-breaking demand for them, industrial activity declined in the first quarter of the year and remained comparatively low in the second quarter.

United States steel producers, on the other hand, foresaw with considerable shrewdness the possibility of a bottleneck in crude steel, the capacity for the production of which had not increased in previous years as rapidly as facilities for producing finished steel products. They began producing and stocking steel ingots in quantity. The ensuing rapid advance in steel ingot production had its customary effect on general business conditions. In addition, the automobile industry, the influence of which on general business conditions is probably second only to that of the steel industry, continued to find a good market for its products. The business tide turned in April, and industrial production generally expanded.

But it took the impact of the U.S. defence program, or at least the active anticipation of it, to initiate the genuine boom that characterized the last quarter of 1940. The first of a series of laws authorizing huge increases in the military and naval establishments was passed in June. Thereafter, considerable time was required to organize the defence program, since it involved an unprecedented procurement of military and naval supplies and equipment. For much of the new equipment, moreover, existing capacity was insufficient. Consequently the first direct effects of the defence program were not felt until July, and even then they took the form of awarding of several large construction contracts for the expansion of aircraft factories, the construction of new tank and munitions factories and the building and enlargement of air fields.

Nevertheless in August and September the defence program began to get under way on a tremendous scale. By the end of August more than $2,000,000,000 in defence contracts had been awarded. By the end of October the total was more than $8,000,000,000; by the end of November more than $9,500,000,000. From an economic and financial standpoint this sudden demand for military and naval equipment and supplies constituted a stimulus to industrial activity of unprecedented proportions. Steel ingot production rose to virtually full capacity and remained there throughout the fourth quarter. Capacity itself began to be enlarged by the relighting of abandoned furnaces and the construction of new ones.

The demand for skilled labour in the machine tool, aircraft and a few allied industries began to exceed the supply. Employment expanded and wages increased because of higher rates and longer hours. Public purchasing power rose, and the increased activity in the heavy industries was thus transmitted to industry

nerally. Retail trade toward the end of 1940 became unusu-
y active. Consumers' goods manufacturers expanded operations
keep pace with the increased demand. Railroad freight traffic,
ough still depressed in comparison with that of the '20s,
vertheless reached the highest volume in a decade. In all of
ese respects the sudden transition from a peacetime to a war-
eparedness economy followed the customary sequence, though
th pronounced emphasis on the role of engines of war requiring
vanced skills and techniques, both in respect to design and
brication.

But here one comes to a fork in the road, where the parallel
th previous war booms ceases. Previous war booms had brought
arked increases in commodity prices and the cost of living.
dustrial raw material prices advanced moderately in 1939 and
40; but prices in general were stable. The advance in raw ma-
rial prices was indeed mild in view of the circumstance that
some instances, as for example zinc, shortages were reported.
rice stability, obviously a desirable end in itself, seems to
ve been accomplished by political and moral suasion and com-
on consent. Certain influential factions in the New Deal govern-
ent at Washington were determined to keep prices from rising.
ey warned manufacturers not to advance prices. Manufacturers
arned one another and their consumers. The gospel of price sta-
lity was preached with vim and vigour. Curiously enough, the
lf-appointed missionaries succeeded in preventing both them-
lves and their listeners from starting an upward spiral of prices.

Previous war booms had brought booms to Wall street. But the
940 boom brought none. Before the year opened common stock
rices were already lower in relation to general business activ-
y than at any other time in the history of the country, at least
s far back as reliable records are available. As the year
rogressed this abnormal relationship became more abnormal. For
time the spread narrowed slightly, because in the first four
onths stock prices were comparatively steady while business
ctivity declined. But the invasion of Holland in May caused a
reak in the stock market. The market never fully recovered from
at decline despite the subsequent boom in business. Financial
entiment was depressed throughout the year. The number of
ares sold on the New York Stock exchange was the smallest
nce 1921. The price of stock exchange seats fell to the lowest
vel in several decades.

Wall street was depressed by the certainty that any increase in
rofits resulting from the boom in business would be taxed away,
r mostly so. Congress sought hurriedly to pass an excess prof-
s tax. So-called treasury experts demanded and drafted an ex-
ess profits tax bill based on heavy taxation of all net income
ver and above certain percentages of invested capital. Wall
reet opposed the measure with might and main, though the ex-
nt of Wall street opposition never became a matter of public
owledge. Congress was impressed with the argument, which
as perfectly sound, that a similar measure in 1918 had proved to
virtually unworkable, and that Britain and Canada had aban-
oned such taxes for taxes based on profits over and above peace-
me averages. Congress rejected the treasury proposal to the
tent of giving corporations a choice of either basis, but in
riting its own tax law it raised the normal corporation tax to a
w high level. The upshot of the matter was that investors fore-
w little gain in corporation net income after heavier taxation,
gher wages and increased costs all around had been accounted
r.

Liquidation of British-owned U.S. securities was also a depress-
g factor, though probably a minor one. The British authorities
nounced at the end of the year 1940 that liquidation had
en completed in a rather long list of leading stocks, but the
arket did not rally on the news.

The depression in Wall street seemed to have an important bearing on the defence program, though this may have been more apparent than real. Leading investment bankers raised the question whether the defence program was to be financed, in part at least, by private capital. The advantage of that procedure, it was pointed out, was that if part of the new capital required for additional plant, equipment and working capital could be raised through the new-issue market, to that extent the taxpayers would be relieved of what in any case would be a heavy burden. Obviously a depression in the stock market would restrict the amount of new capital which could be raised through the sale of securities to investors. The alternative was a continuation of federal borrowing through the sale of government securities to banks, insurance companies and to a small extent to private individuals. Investment bankers were afraid that the second alternative would lead to almost complete government control over private enterprise.

These fears were lightened to some extent when Loan Administrator Jesse Jones said that the federal government would not stand in the way of private financing whenever that could be arranged advantageously and expeditiously. Congress passed a law making defence contracts negotiable instruments for the purpose of obtaining bank loans. The Reconstruction Finance corporation, however, continued to stand ready to make loans at rates so low that private financing would be unattractive to many investors. The question remained to the end of the year in a somewhat muddled state. There was a moderate revival in new private financing toward the end of the year through the sale of new securities by investment bankers. There was a much greater revival, however, in the commercial loans of the member banks of the federal reserve system. Many of these loans were of rather long maturities. In the old days many of them would have been made via the new security market.

The banks, however, were in circumstances of unprecedented affluence with respect to lendable resources, mainly because of an extension on an even larger scale of the heavy gold import movement which had begun in the second half of 1938, so that at the end of the year the monetary gold stock amounted to approximately $21,982,000,000, as compared with $17,644,000,000 at the end of 1939. In part these imports represented payment for merchandise exported, especially war exports to Britain. In larger part, however, they represented a further flight of capital from other parts of a war-torn world.

The net consequence in the United States was a further increase in already swollen bank reserves. By the end of the year the excess reserves of the reporting member banks of the federal reserve system, notwithstanding the fact that reserve requirements were high, amounted to $6,620,000,000.

The existence of these excess reserves raised still another question which seemed of paramount importance with respect to the defence program. Some economists and some federal officials, notably Marriner S. Eccles, chairman of the board of governors of the federal reserve system, expressed the fear that these reserves formed a basis for a potential credit inflation which might become an actual inflation as the demand for war supplies and skilled workers became intensified, thus tending to create an upward spiral of commodity prices and wage rates. Toward the end of the year, indeed, Mr. Eccles proposed a legislative program designed to put the federal reserve authorities back in control of the money market. This program provided among other things for giving the board of governors greatly enlarged powers over the reserve requirements of the member banks. The mere mention of this plan resulted in a decline in United States government bonds a few days before the end of the year.

Otherwise, however, the money market remained extremely easy

to the end. The only disturbance of any consequence in the course of 1940 was in May, when the German blitzkrieg was accompanied by a decline in high-grade bond prices. This decline proved temporary, however, and was followed by a renewed rise which carried high-grade bond prices to new high records for all time.

International trade, and with it the U.S. export trade, was changed radically by the spread of the war. One by one, as the German conquest engulfed European nations, U.S. exports to the conquered countries came to a standstill. Nevertheless these losses, severe though they were, were more than offset by increased exports to other countries, especially to Great Britain and to Latin America. As was the case in the closing months of 1939, the Latin-American demand for U.S. goods continued to be stimulated by the cutting off of the customary European sources of supply.

The chief U.S. sufferer from the consequences of the war was the farmer. Agricultural exports except cotton declined sharply. Cotton exports also declined sharply in the second half of 1940, after the termination of a subsidy and a barter arrangement with Britain. On the continent of Europe shortages of food began to be reported. According to U.S. farm experts, these shortages seemed bound to become worse with the prolongation of the war. But the British government refused to permit the shipment of American foodstuffs to European war sufferers. The war boom in the United States, on the other hand, created increased domestic demand for U.S. farm products. Domestic consumption of raw cotton was the largest on record. Cash farm income was higher than in 1939. Some farm experts predicted that in 1941 increased domestic demand would more than offset the loss of European markets for all farm products. But that remained a matter of conjecture.

National debts again increased at unheard-of rates. In the calendar year 1940 the total receipts of the United States treasury were $5,834,000,000, as compared with $4,918,000,000 in 1939. But total expenditures rose to $9,800,000,000, as compared with $8,938,000,000 in 1939. The federal deficit hence showed little change; the 1940 deficit was $3,966,000,000, as compared with $4,020,000,000. The total expenditures for the calendar year 1940 included few defence expenditures in comparison with the amounts obligated for future payments. It was predicted that total government expenditures for the fiscal year 1942 wo amount to the staggering sum of $17,000,000,000. It was ho that ordinary expenditures could be financed out of revenues, there was no hope of financing defence expenditures except f further borrowing. The gross debt of the United States expected presently to reach $65,000,000,000, as compared wi new high record of $45,024,631,488 at the end of 1940.

In Great Britain the fiscal situation was naturally even wo Despite a rapidly increasing burden of taxation, huge borrow was necessary to pay for war expenditures. Similarly all d the world, it seemed probable that at no time in history, tainly in modern industrial history, had national fiscal situati been in such conditions of utter chaos. In the light of that ov whelming fact details as to financial conditions become mean less, even in the few countries for which details continue to available. In Britain there has been considerable inflation. Wa and the cost of living have advanced sharply, with the us discomfiture of white-collar workers and others of comparativ stable incomes. Japan has had to contend with inflation tendencies for several years, and the situation there is likely get worse before it gets better. Statistics on economic conditi in most countries were discontinued with the spread of the w but even if they were available they would merely add m horrible details to the virtually universal picture of ha wrought by wartime conditions.

U.S. economists and business leaders were justifiably concer over the probable seriousness of the next postwar depressi Various schemes were proposed in the course of 1940 for soft ing the blow.

With world conditions what they were in 1940, it seemed likely that any scheme could be devised that would alleviate any considerable extent the deepening shadows of the inevita consequences of the aftermath. (*See* also BANKING; BON COST OF LIVING; EXCHANGE CONTROL AND EXCHANGE RAT EXCHANGE STABILIZATION FUNDS; GOLD RESERVES AND G STANDARD; INTERNATIONAL TRADE; STOCK EXCHANGES; STOCK and business statistics under countries and states.) (D. W. E.)

Finland. An independent republic of northern Europe; capit Helsinki; president, Risto Ryti.

Area and Population.—The area is 134,000 sq.mi. (land a

ELEVEN HOURS of Russian bombing on Feb. 2, 1940 reduced Sortavala on Lake Ladoga in Finland to a mass of ruins

'ILLAGERS OF TAMMISAARI, Finland, took refuge in the woods during visits f Russian bombers to their town in the early weeks of 1940

21,000 sq.mi.), after cession of 13,500 sq.mi. to the U.S.S.R. ı 1940. The population is about 3,800,000, not materially reduced y the cession of territory, because most of the 450,000 people ffected moved into other parts of Finland. Chief towns (pop. st. Jan. 1, 1939): Helsinki (304,965); Turku (74,315); Tamere (76,730). Viipuri (74,247) was ceded to Russia. Language nd nationality, 90% Finnish, about 10% Swedish. Religion, utheran Christian.

History.—The war between Finland and Russia began on Nov. ;0, 1939, after the failure of several weeks of negotiation. As the urtain went up on the new year it looked as if the heroic and lesperate Finns might have a chance to withstand the Russian nslaught at least if they could get aid in material and men from utside. Their fortified Mannerheim line on the Karelian isthmus vas proving strong, the ski troops in the north were fighting ı guerrilla-type war with cleverness and success and the nation ıs a whole was throwing its entire energies into the struggle for xistence. The women of the Lotta Svärd organization did notable vork. But gradually the U.S.S.R., which had underestimated oth the determination and the skill of its opponents, brought o bear the weight of its vast resources of men and armaments. By slow but irresistible bombardments they rocked the pillboxes of the Mannerheim line, bombed 32 of Finland's 38 cities from he air, dropped about 100,000 bombs and destroyed 1,800 buildngs. The number of Finland's killed and missing men mounted o almost 23,000 and another 43,500 wounded. With their line roken and the casualties rapidly increasing, the Finns could not old out alone.

Volunteers from abroad could not reach Finland quickly enough or in great enough numbers. Several thousand came from Sweden, which also supplied munitions and medical supplies to n amount equalling about $125,000,000. But troops from the vest were not allowed to pass through Norway and Sweden in umbers greater than 100 per day because of the fear of the Scandinavian states that they would become themselves a main heatre of war. If large-scale aid came from Britain and France t was obvious that Germany would take measures to check it.

The result was that on March 12, 1940 the Finns signed a eace in Moscow. Territorially the treaty came to mean (with the greement on details dated April 29): (1) cession of the Karelian isthmus to the U.S.S.R.; this included the eastern islands in the Gulf of Finland, the city of Viipuri (Viborg) and the region around Lake Ladoga; (2) parts of the communes of Kuusamo and Salla on the middle eastern frontier; (3) the western part of the Rybachi peninsula on the Arctic sea (though Finland retained a tiny opening on the sea in the Petsamo region). In addition to these outright cessions, Finland leased to the U.S.S.R. for 30 years the Hango peninsula in the southwest, with surrounding islands. Russia had established herself once more in the Baltic. In a short time she was to consolidate her position further in Estonia, Latvia and Lithuania.

These losses, together with Finland's pledge to complete an east-west railway across the central part of the country, meant an almost helpless strategic situation and severe economic loss. Finland lost access to Lake Ladoga and the eastern gulf coast where about one-third of her fishing had been carried on. She lost rich forest resources, 10% of her arable land, her fourth largest industrial centre and 625mi. of railway. Perhaps a fair estimate of the monetary losses is $600,000,000 and this is larger than the annual national income. The losses were the more staggering because almost the entire population (450,000) of the ceded areas had to be resettled in other parts of a country of meagre natural resources, and a dry season reduced the food crops of 1940.

Money for war and reconstruction poured in from the outside world, especially from Sweden and the United States. Hoover's "Finnish relief," for instance, raised about $3,500,000. In 1939 and 1940 Finland had to postpone and ask for readjustment of its war debt payments to the United States. This was granted, as well as extensive government credits. But the problems of rebuilding were accentuated by the continuance of war around Finland, which made impossible the resumption of normal trade. When in the late summer of 1940 the Germans asked for transit privileges through Finland to Norway, the Finns were glad to grant the request, thinking that the presence of German troops might be a salutary warning to the Russians to encroach no farther westward.

The leaders of Finland's second war of independence began even in 1940 to leave the stage. Baron Mannerheim, the military genius of the campaign, stepped into the background. The zealous peasant president, Kjösti Kallió, was stricken with a heart at-

tack in August. In December he resigned, amid popular ovations to the reformer and statesman who personified the best of Finnish spirit. Ready to retire to his country home, he went to the railway station with a military guard of honour, turned and said to the people, "Good-bye, thanks for everything" and fell back dead in the arms of his friend, Field Marshal Mannerheim.

Elected to succeed him was the leading financial statesman of the country, the logical man to head up the economic reconstruction, former Premier Risto H. Ryti. The new president was once a member of the London bar and is an exceptionally able banker.

Finland tightened her belt and looked forward hopefully, sanely planning for the clearing of new lands and the building of new cities for the 500,000 rendered homeless, and for the restoration of buildings, such as the demolished technical university in Helsinki. Her national independence was intact and her spirit appeared to be equal to her emergency.

Finance and Banking.—At the last free quotations of 1939 the Finnish markka stood at 49 to the dollar, 197 to the pound. The Bank of Finland had outstanding 3,300,000,000 Finnish markka in currency, a gold reserve of 1,180,000,000 FM and foreign holdings of 1,800,000,000 FM. National budget (est. 1939): revenues, 5,534,700,000 FM; expenditures, 5,432,800,000 FM. Foreign debt (Sept. 1939), 1,040,000,000 FM; internal debt, 2,810,000,000 FM. (F. D. S.)

Trade and Communication.—External trade in 1938 (merchandise): imports 8,607,300,000 FM; (Jan.–Aug. 1939) 5,480,700,000 FM; exports 8,398,000,000 FM; (Jan.–Aug. 1939) 5,759,600,000 FM. Communications: roads, state (1938) 20,235 mi.; railways, state (1938) 3,670 mi.; shipping (June 30, 1939) 626,000 gross tons; motor vehicles licensed (July 31, 1939): cars 29,675; commercial vehicles 22,860; cycles 7,677; wireless receiving set licences (1938) 293,896; number of telephone subscribers (1938) 7,720.

Agriculture, Manufactures, Minerals.—Production 1938 (in metric tons): wood pulp 2,110,000; oats 826,000; (1939) 798,000; rye 369,000; (1939) 331,000; wheat 256,000; (1939) 227,000; barley 207,000; (1939) 192,000; potatoes 1,198,000; copper 12,600; butter, creamery 33,000; beet sugar 13,600; superphosphates of lime 62,000. Industry and labour: number of factories (1937) 4,246: employees 207,506. Industrial production index (1929=100) (average 1938) 155·6 (average June 1939) 155·6. Employment index (1929=100) (average 1938) 109·0; applicants for work (average 1938) 3,602; (average June 1939) 2,091.

BIBLIOGRAPHY.—J. O. Hannula, *Finland's War of Independence (1917–18)* (London, 1939); J. H. Jackson, *Finland* (1940); *Finland of 1940–41* (Appendix to Finland Year Book, 1939–40) (1940); H. B. Elliston, *Finland Fights* (1940).

Finley, John Huston (1863–1940), U.S. educator and editor, was born in Grand Ridge, Ill., Oct. 19. He was graduated from Knox college, Galesburg, Ill., in 1887 and spent the next two years at Johns Hopkins university. In 1892 he was called to the presidency of Knox college and remained there until 1899, when he accepted the editorship of *Harper's Weekly*. While holding this post he planned the news magazine *World's Work* with Walter Hines Page, and intended to become one of its editors, but he was called to the new chair of politics at Princeton university. He remained at Princeton until 1903, when he was made president of the College of the City of New York. He resigned in 1913 to become commissioner of education and president of the University of the State of New York, serving until 1921, when he was named an associate editor of *The New York Times*, becoming editor-in-chief in 1927 and editor emeritus in 1938. He was in France when the United States entered the World War of 1914–18, offered his services to General Pershing, and was made head of the Red Cross commission in Palestine and the near east during the World War (1914–18). He was in demand as a lecturer and gave courses at the Sorbonne, Paris, the University of Edinburgh and several American universities. He was the author of many books. Thirty-two universities conferred honorary degrees upon him and he was decorated by 14 foreign governments. He died in New York city, March 7.

Fire Insurance: *see* INSURANCE, FIRE.

Fires and Fire Losses. The losses by fire and lightning—the statistics compiled by the National Board of Fire Underwriters cover these two forms under one head—amounted in 1940 to $306,469,520. For each of the years since 1938 the total has been just above $300,000,000. It was lowest in 1938, $303,050,000 and highest in 1939, $313,494,840, so 1940's record marks a slight falling off from the previous year, but an advance over 1938. It is customary to divide the losses into those where the damage is $10,000 or more and those below that figure. In December there were 278 fires which caused more than $10,000 damage, the total amount of damage done being $10,758,300. This is about 40% of the total loss by fire during December.

Two losses suffered during the year should be especially mentioned, for while they were not fire losses, they were covered by the same groups of companies that write fire insurance. The first was the large loss due to the heavy windstorm of Nov. 1940. Close estimates were to the effect that the number of claims would reach at least 125,000 and that the average claim would be about $20.

The other important loss was the disaster of the Tacoma bridge. There was some question as to which group of companies would pay this loss, but that point is not of moment here. The state claimed, at latest advices, a total loss which would amount to something over $5,000,000; the final settlement might take some months. (*See* also INSURANCE, FIRE.) (E. R. H.)

Fires and Fire Prevention: *see* STANDARDS, NATIONAL BUREAU OF.

THE FIRE FIGHTERS OF LONDON did heroic service 24 hours each day after Germany began mass raids on the city in Sept. 1940

sh and Wild Life Service. The Fish and Wild Life service was established in e United States department of the interior on June 30, 1940, consolidating the bureau of biological survey and the bureau fisheries, in accordance with the president's Reorganization der No. III. Under Dr. Ira N. Gabrielson, director, former ief of the biological survey, the service includes divisions of ld life research, fishery biology, federal aid in wild life restora- on, land acquisition, wild life refuges, construction and Civilian onservation Corps operations, game management, fishery indus- ies, fish culture, Alaska fisheries and predator and rodent con- ol. W. C. Henderson, former associate chief of the biological rvey and Charles E. Jackson, formerly deputy and acting com- issioner of fisheries, are assistant directors.

Outstanding problems of 1940 related mainly to effective or- nization and to the relationship of the service's work to the eds of national defence. The wild life division of the National ırk service was transferred to the biological survey before the tablishment of the new service. The service's field work was organized in five regions, instead of nine, with headquarters in ortland, Ore.; Albuquerque, N.M.; Milwaukee, Wis.; Atlanta, a. and Boston, Mass. Establishment of the new service was the max of the year's organizational changes.

Wild life conservation which helps to make "a country worth ing in" plays an important part in national defence preparations helping to build up individual and national morale. More ngible emergency contributions have also been pointed out. ne value of the food resources in fishes, for example, has been nphasized in many ways, including the establishment of radio ıtlets in Boston, Chicago, Jacksonville and New Orleans for the ily broadcast of market news reports to encourage the eco- omic and profitable use of fishes as food. Fisheries' personnel d material have been of assistance to the navy and the fishing et is regarded as a valuable reserve. The service is prepared meet emergency needs for controlling the numbers of birds d mammals that destroy crops and livestock and to co-operate other ways in the defence program. The importance of main- ining conservation policies during the stress of emergencies, as ell as at other times, and avoiding unwise exploitation has en emphasized.

The actual work of 1940 was in the main a continuation of ograms already under way. Six new laboratories for fishery search were established, bringing the total to 11, including a w floating laboratory for studies on the fisheries' grounds. Re- arch on birds and mammals continued in the field and in lab- ratories, including two new ones at the Patuxent Research efuge, in Maryland.

Statistics compiled indicated that in 1938, the latest year for hich complete data are available, the landings of United States shing craft totalled more than 4,250,000,000 lb. The wholesale alue of fishery products exceeded $251,000,000. About 250,000 ersons were employed in capturing, processing and wholesaling e catch. Estimates compiled indicated that the big game popu- tion of the United States in 1939 was more than 5,800,000. he annual waterfowl inventory in Jan. 1940 resulted in an esti- ate of more than 65,000,000 ducks and geese, representing the fth consecutive annual increase as a result of the restoration ogram. Compilations of state reports indicated that in the 938–39 seasons more than 7,858,275 persons paid a total of 10,837,168 for fishing licences and more than 7,500,000 paid a tal of $12,600,000 for hunting licences. Sales of the federal amp required of all over 16 years of age who hunt migratory aterfowl continued to increase, a total of 1,111,561 stamps hav- g been sold in the 1939–40 year.

The federal wild life refuge system increased to a total of 263 refuges, with an acreage of 13,595,812. Output of fish and eggs at the 110 federal hatcheries during the year ended June 30, 1940, approximated 7,400,000,000, a drop from the 1938–39 8,042,000,000 attributed mainly to curtailment of cod, haddock and flounder production; 24 out of the 45 species handled were distributed in increased numbers.

Regulations governing migratory-bird hunting in 1940 provided a 60-day hunting season in each of 3 zones, an increase over the previous 45-day season, but shortened seasons on woodcocks and reduced bag limits on geese, mourning doves and white-winged doves.

The program for aiding the states in wild life restoration became more extensive and more effective. In all, 237 projects were begun by the states with federal aid during the year ended June 30, 1940, involving $2,082,735, a great increase over 1938–39, first under the program, when 58 projects were begun at a cost of $343,932.

An increased federal appropriation of $2,300,000 became available on July 1 for this program, which provided for federal payment of 75% of the cost of projects carried on by the states with federal approval. (*See* also BIRD REFUGES; WILD LIFE CONSERVATION.)

Publications in 1940 included the following: Wildlife Research Bulletin 1, *Food Habits of a Group of Shorebirds: Woodcock, Snipe, Knot, and Dowitcher;* Technical Bulletin 711, *Economic Status of the English Sparrow in the United States;* Investigational Report 34, *Home Canning of Fishery Products;* Bulletins 31 and 32, *Natural History and Method of Controlling the Starfish* and *The History and Development of the Fisheries of the Columbia River;* Miscellaneous Publication 355, *Hart Mountain Antelope Refuge;* Conservation Bulletin 1, *Attracting Birds;* and *The Birds of Oregon,* published by the Oregon State college, as a co-operative project. (H. Z.)

Fisher, Herbert Albert Laurens (1865–1940), British historian, was born in London, March 21, and died there April 17. For a biographical sketch see *Encyclopædia Britannica,* vol. 9, p. 291.

Fisher, John Stuchell (1867–1940), U.S. attorney and state governor, was born in South Mahoning township, Pa., May 25, and was graduated from the Indiana (Pa.) State Normal school in 1886. He was admitted to the bar in 1893 and practised in Indiana. He was a member of the state senate for eight years and was chairman of the committee which reported on frauds in connection with furnishing the new state capitol. He was appointed state commissioner of banking in 1919 and was elected governor of Pennsylvania on the Republican ticket in 1926. On the expiration of his term he opened a law office in Pittsburgh. He died in that city June 25.

Fisheries. The fisheries of the world, according to the tabulation of the U.S. Fish and Wild Life service, annually yield about 17,500,000 tons of 2,000lb. each, of food and industrial products, with a value of about $759,000,000. The fisheries conducted in the North Atlantic area by bordering countries produce 7,500,000 tons, valued at $371,000,000; with the production by eastern North Atlantic countries amounting to 6,100,000 tons, valued at $310,000,000, and by western North Atlantic countries to 1,400,000 tons, valued at $61,000,000. The species of importance in the North Atlantic area include herring, cod, haddock, mackerel, halibut, swordfish, crabs, shrimp and oysters. The production of some of these species has declined, due to over-fishing or other causes. As this is a threat to the livelihood of many hundreds of thousands of fishermen and shore workers and to the food supply of nations, the various governments concerned took steps in previous years to conserve and sustain these fisheries. During 1940, however, because of the need for foodstuffs, created by the war situation, little was accom-

plished in this direction. In fact, in some of the warring countries conservation regulations were relaxed in an effort to increase fish production, without regard to the effect of unrestricted operations on the maintenance of fish supplies in the sea. Many other countries having access to fishery resources and not engaged in hostilities were in 1940 making every effort to exploit their fisheries.

As a result of the war in Europe fishing operations by the warring nations were considerably curtailed during 1940. In Great Britain alone, it has been estimated that well over one-half of the fishing fleet was taken over by the admiralty. The remainder found it difficult to conduct fishing on the usual banks. In order to make up for the deficiency of its domestic fisheries, Great Britain, especially England, therefore looked to other countries for a source of fishery foods. Early in 1940 large supplies of fresh fish were imported from Norway and the low countries. After the domination of these countries by the reich these sources were cut off and considerable dependence was placed in supplies of frozen cod fillets from Newfoundland and Canada and canned fish from various countries. Because of difficulties in securing refrigerated cargo space on transports and of holding chilled fish in cold storage in England, the importation of frozen fish was not entirely successful. Furthermore, since the English people have been accustomed to eating the domestic catch of cod in fresh condition, frozen fish of this species did not find ready sale. As a consequence there was a falling off in the fresh fish business due to the shortage of raw fish and resulting higher prices. The black-outs also were reported to have had an effect in curtailing fish sales, for they kept people at home away from the fried fish shops, a channel through which up to 70% of the fresh fish supplies of England have been marketed in normal times. England, however, took considerable amounts of frozen fish during 1940 and large quantities of tinned fish, such as salmon and sardines originating to a great extent in the United States and Canada. A schedule of maximum selling prices for canned salmon, sardines, herring and pilchards was placed in effect in Great Britain under orders of the ministry of food, with apparently little interference with normal trade conditions.

While the situation in the warring countries was not conducive to normal fishing operations during 1940, various other countries took renewed interest in exploiting the fishery resources. For instance, Portugal increased her codfishery on the Grand Banks off Newfoundland with financial and other assistance from the government. During three successive seasons the catch has increased progressively, the catch in 1939 being double that of 1934 and five times that of 1930. The position of the Portuguese canned sardine industry also improved in 1940, due to a larger catch than in recent years and also to orders from warring countries, especially England. Portugal also made an effort to expand sales of canned sardines in the United States to replace diminishing imports of this product from Norway. In this connection Egypt, during 1940, also offered encouragement toward the establishment of a local sardine-canning industry.

Spain planned to construct a new codfish processing plant to be supplied by a fleet of six large fishing vessels. Rumania, with the assistance of German credit, modernized its fishing fleet in the Black sea. In South Africa the production of frozen spiny lobster tails has assumed large proportions. Increased refrigeration facilities have been installed on transports touching at Cape Town to ship this product to various ports in Europe and the United States. Iceland effected improvements in the fishery industry toward maintaining her place as a fishery export country.

In Japan a merger was effected of various fishery sales companies whereby the sales to exporters of canned marine products, except salmon and crabs, were handled by one firm which exercised control over prices and distribution. It was expected that large part of the production handled by the new concern would sold to the military and foreign currency countries. In Austra the output of tinned fish was expanded. The Malay governm also encouraged the development of local fisheries, which yi about 100,000 tons annually. Schools were established to give struction to native fishermen in navigation, use of powered cra construction and operation of nets, handling and marketing fish and other related subjects.

The fisheries of North America, which annually yield o 3,000,000 tons on both coasts and in the interior waters, w prosecuted with renewed vigour in 1940. In Canada efforts w made to increase production of frozen and tinned fish to meet demand for food in Great Britain. However, the pack of salm in British Columbia decreased slightly under the previous ye On the other hand, increased activity was noticed in the cann of herring. On the Atlantic coast of Canada large quantities cod were frozen for the export market. In spite of the lat development it was necessary to continue various types of gove ment bounties to aid in improving the lot of the Canadian fi ing population, especially in the maritime provinces.

In Newfoundland the government continued its efforts to i prove the economic status of the fishing industry. Facing a cline in the export market for salt cod, which is the main out for this product, steps were taken to reduce costs of fishing by ploring new and more productive fishing grounds and by devel ing more efficient gear. Further aid was extended to the fi ing industry by establishing fishing guarantees and shipbuild bounties, by encouraging co-operative associations among fish men to reduce marketing costs, and by the development of m exportable fishery products, such as frozen fish for the Europe trade and cod liver oil of higher quality.

The position of the fishing industry in the United States i proved during 1940, brought about largely by a higher pr structure resulting from curtailment in the production of so species of fish and increased activity in some branches of fisheries due to anticipated war orders. A strike of the fish men working on a number of large fishing vessels operating of Boston, Mass., curtailed fish landings at that port during late spring and early summer. Further curtailment in fish effort was brought about by the government purchase of a num of fishing vessels on the Atlantic and Pacific coasts, during the l ter half of the year, for conversion into naval craft. T stimulated the construction of new fishing vessels for replacem purposes.

It was reported during the early fall that Japan had giv notice of its intention to terminate the international convent for the conservation of the North Pacific fur seal. Signa countries to the convention, made effective in 1911, are the Uni States, Great Britain, Japan and Russia (U.S.S.R.). Any tre power may terminate the treaty by giving one year's writ notice to all other parties to the treaty. In 1940 the fur s herd of the Pribilof islands, administered under the convent by the department of the interior through the Fish and Wild L service, numbered over 2,000,000 animals. When the treaty came effective the herd numbered about 125,000 animals. In interim, to and including the season of 1940, about 800,000 s plus animals were taken under regulated conditions for th pelts. Proceeds from their sale each year have been divided am the signator countries.

The production of canned salmon in Alaska was less in 1 than in the previous year, due mainly to the smaller output of salmon in the Bristol bay region. Packers' stocks of all grades canned salmon at the beginning of the last quarter of 1940 w about 1,600,000 standard cases, or about 800,000 cases less t

hand at the same time in 1939. The situation in the salmon lustry encouraged the canning of larger quantities of tuna, sar-nes and mackerel. Increased quantities of fish and shellfish re frozen during 1940.

The U.S. government sponsored an expedition to explore areas king crabs off the Alaska peninsula and to conduct studies in capture and canning of this shellfish. Two vessels were used the expedition—one a crab-fishing vessel and the other a fac-y ship, on board which the crabmeat was canned. Operations re centred off the south coast of the peninsula during the e summer and fall. The expedition returned to Seattle, Wash., ut the middle of December for reoutfitting. It is planned that a second edition will be dispatched early in 1941 to fish off the north coast of peninsula. The U.S. government hopes this exploratory investigation l encourage U.S. interests to enter this fishery, which heretofore has been ried on by Japanese vessels and fishermen.

In various countries of South and Central America an interest was shown exploiting local fishery resources. Attention was directed mainly toward ducing marine products for domestic consumption to replace foods from oad. In this connection individuals from several South American coun-s made investigations of the fisheries in the United States, and under U.S. government's program for co-operation with other American re-lics several were assisted in fishery matters.

Increased activities toward co-operative effort among fishermen were re-ted during 1940. The associations of lobster fishermen in Newfoundland e the largest shippers of this shellfish from Newfoundland. Higher es prevailed. The lobster fishermen of Canada, many supplying lobsters co-operative canneries, were not in such a favourable position. Because restrictions on the importation of canned lobster in the United Kingdom l France, about 85% of the foreign market was eliminated. Therefore, ler the War Measures act the Canadian government was empowered to a limited amount of canned lobster for sale in whatever markets could found and an additional fund was set up to conduct an advertising cam-gn for canned lobster. Purchase of the product by the Canadian govern-nt was dependent upon a showing that the packers did not pay below a le of minimum prices to the lobster fishermen for the catch.

In Newfoundland efforts were directed toward developing co-operative ieties among cod fishermen who have been in a depressed condition be-se of the falling off of the export markets for salt cod. Reports from huania indicated that one co-operative controlled one-fourth of the her-g marketed in that country. These fish were marketed through some 100 ail co-operative societies. A fish-marketing co-operative was formed in eden which is owned in part by fishermen on the west coast of the ntry. In British Columbia a cod fishermen's co-operative association s organized which aided in stabilizing the marketing of "lingcod" caught its members. Several credit unions were formed among the fishermen this province. On the east coast of Canada, in New Brunswick and Nova tia, several new fishermen's associations were formed which successfully ndled fresh and canned fish.

During 1940 unusual interest was evidenced by various countries in uring an adequate supply of fish oils, potent in vitamins A and D. Ex-ts of cod-liver oil from Norway to the United States declined during the ly part of the year and practically ceased after Norway was occupied Germany. Canada prohibited the export of cod-liver oil except under nce approved by the Wartime Prices and Trade board. A strong demand, h prices higher than in the United States, resulted in increased shipments Newfoundland cod-liver oil in favour of Great Britain. In view of this dition, manufacturers and importers of vitamin fish oils in the United tes exerted efforts to augment domestic supplies. Toward this end a her extensive fishery was developed in California for soupfin sharks, the r of which is potent in vitamin A. The meat of this shark is of little mercial value. This is the first instance in the U.S. where a fishery has n developed because of an unusual value being placed on a visceral an. The manufacture of synthetic vitamin D has received impetus be-se of world events. One such product is based on irradiated cholesterol ived from sea mussels. The manufacture of this product has also created ew fishery for sea mussels which is conducted along the coast of Virginia. retofore this mussel had little or no market value. In the United States erest also was shown in the extraction of vitamin A and D concentrates n certain low-cost fish oils, without rendering the original oil unfit for normal use in the manufacture of soap, paint and other products.

Whaling.—Since 1920 the whale fisheries of the world have been prose-ed with renewed vigour. Operations have been centred almost entirely the Antarctic. Previously little whale fishing was done in this area be-se of dangerous weather and ice conditions. Such adverse conditions now, ever, are no obstacle to the staunchly built factory ships and killer ts. The take here has been enormous. During the period from the season 9–20 (the inception of the fishery on a large scale in the Antarctic) to 1938–39 season, inclusive, 421,708 whales were captured in this region, n which 32,741,897bbl. of oil were produced, according to report XIV 40) of the Committee for Whaling Statistics, Oslo. One barrel of about gal. equals one-sixth ton. One ton equals 1,016kg. or 2,240lb. During 1938–39 season alone 38,356 whales were captured in the Antarctic ery, yielding 2,820,771bbl. of oil. This was less than the production ing the previous season. British whaling accounted for 11,192 whales 891,791bbl. of oil; Norwegian, 11,521 whales and 842,712bbl. of oil; anese 7,540 whales and 483,476bbl. of oil; German, 5,066 whales and ,149bbl. of oil; and whaling by craft of the United States, Panama and entina accounted for 3,037 whales and 228,643bbl. of oil.

During the 1938–39 season 34 floating factories and two shore stations rated in the Antarctic. These were serviced by 281 catcher boats. Dur-the same season 12,705 men took part in this fishery, of whom 7,517 were Norwegians, 2,793 Japanese, 1,386 German, 866 British and 143 others.

Preliminary figures indicate that the production of whale oil in the Antarctic during the 1939–40 season was approximately the same as in the previous season, although Germany did not engage in the fishery. Japan, however, about doubled her production. That of Norway was slightly higher while the production by the other countries was about the same, compared with the season 1938–39.

Apprehension as to the future of the whale fishery, in the face of such intensive prosecution, led to conclusion of an international convention between 26 powers for the regulation of whaling. This became effective in 1935. During the previous season (1934–35) an average of 211·4 whales were killed per catcher boat in the pelagic fishery of the Antarctic. Within two seasons (that is, by the season 1936–37) the average kill per catcher boat dropped to 178. More effective regulations seemed necessary, culminating in an international agreement for the further regulation of whaling which was signed in London, June 8, 1937, on behalf of the Argentine republic, commonwealth of Australia, Germany, the Irish Free State, New Zealand, Norway, the Union of South Africa, the United Kingdom of Great Britain and Northern Ireland and the United States of America. This agreement, which was in force in 1940, was further amended to restrict whaling as regards prohibiting the killing of humpback whales in the Antarctic, at a meeting in London in 1938. In 1939 another conference in London recommended the extension of this prohibition for another year. During the 1938–39 season the catch per killer boat in the Antarctic dropped to 136, the lowest ever recorded, indicating a considerable decrease in the yield of whaling. (*See* also OCEANOGRAPHY.) (R. H. F.)

Fitzgerald, Francis Scott Key (1896–1940), American novelist, was born in St. Paul, Minn., Sept. 24, and was educated at Princeton university. He left college during his senior year in 1917 to enlist in the army for service during the World War. His first novel, *This Side of Paradise,* a work describing the actions and emotions of irresponsible youth, was published in 1920. He published several other novels in later years, among them *The Great Gatsby.* He died in Hollywood, Calif., Dec. 21.

Five-Year Plan: *see* UNION OF SOVIET SOCIALIST REPUBLICS.
Flax: *see* LINEN AND FLAX.

Floods and Flood Control. *Federal.*—Construction on 185 congressionally-authorized flood control projects was completed or was under way in 1940. Surveys and the preparation of plans and specifications were also in progress for many dams and flood protection projects at still other localities throughout the United States.

In New England, construction was in progress on five dams in the Merrimac and Connecticut river basins. Construction of authorized levees and flood walls at seven principal cities along the Connecticut river in Massachusetts and Connecticut was approaching completion.

In the Ohio river basin above Pittsburgh two dams were completed and construction of two other dams was well advanced. Channel improvement of the Conemaugh river at Johnstown, Pa., was about 55% complete. Construction was initiated on the Youghiogheny dam and on the local protection project at Kittanning, Pa. Local protection projects in the Ohio river basin below Pittsburgh were completed for Middlesborough, Ky., and for sections of three other principal cities and were substantially complete at Ceredo and Kenova, W.Va. Construction was in progress in 1940 on the remaining sections of the above-referred-to three projects, and protection works were also under way at 11 other Ohio basin localities in Ohio, Indiana and Illinois and on several agricultural levee projects in the Wabash river basin.

In the southwest, Conchas dam on the South Canadian river in New Mexico was completed. Construction was under way on seven other dams in this area.

On the Pacific coast the projects for flood protection in the Los Angeles county drainage area and Santa Ana river basin, involving the construction of reservoirs, dikes and channel improvements, were progressing rapidly. Construction was under way on the Mud Mountain dam, Wash., and on two dams in Oregon. Twenty-two local protection projects along the Columbia river

and its tributaries in Washington and Oregon were completed and others were under way in 1940. (J. L. S.)

Floods.—The world experienced the most severe winter in years during Jan. and Feb. 1940. This was particularly true in Europe. With the advent of spring the usual floods due to melting snow and ice occurred in many regions and particularly on the Danube in southeastern Europe. Much damage was done by flood waters and crop damage was caused by the late cold spring which prevented planting.

In the southwestern United States sudden violent rainstorms called cloudbursts took their usual toll by causing violent streams to arise in usually dry gulches, with disastrous resulting damage to highways and railroads.

During the rainy season on various portions of the earth's surface floods occurred due to climatic conditions over which man has little or no control. Such floods occurred on the Ohio and Mississippi rivers in the United States, on the Hwang-Ho in China, the Ganges in India and the Nile in Egypt.

In California in February floods caused widespread damage closely approximating conditions in 1937 when severe damage resulted. During that month two distinct floods occurred on the Sacramento river, causing damage to ranches, towns, highways and railroads. The four-day rainstorm caused the Sacramento to pour over its levees on a 100-mile front, creating a lake which submerged some of the smaller towns under 20 feet of water. During that period the rivers of Oregon, Washington and British Columbia reached the flood stage.

There is little that man can do to protect himself from such floods as prevailed in California in 1940. Flood reservoirs, such as those projected by some engineers of the day, would be of trivial consequence in meeting such downpours and stream runoffs as those that occurred in some of the California sections. Under ordinary flood conditions they would doubtless prevent great damage at times, but when the heavens open, as they did during this period in 1940, and millions of tons of water are concentrated into the canyons and ravines within a very few hours, no ordinary works of man can hold them. Human beings must then pay for the advantages they acquired when they settled in the low spots.

In September in New Jersey and Delaware torrential rains caused destructive floods in scores of communities which caused five deaths. Hundreds of families were rendered homeless and the medical authorities took unusual precautions to prevent disease, such as typhoid fever, from spreading. These floods were caused by an Atlantic hurricane far out at sea, and there is nothing that man can do to prevent such a storm from playing havoc with homes, property, communications and human lives. The flood raced down the valley at 50 m.p.h. and cut off the drinking-water supply from many towns.

In September flood damage precipitated by a cloudburst in three northern Oklahoma counties was estimated at more than $1,000,000 as the Arkansas river's overflow slowly withdrew from the little bottomland towns of Jenks and Bixby.

The Red Cross and the civilian conservation corps made a survey of the Bixby-Jenks area in southern Tulsa county, where the loss was estimated at $750,000.

In November portions of New Mexico, Oklahoma and Texas were swept by floods which carried away homes, farm buildings and livestock. Five Texas rivers were on the rampage. Whole families sought safety in treetops as the floods swept away their homes and livestock. Twenty-one inches of rain fell during one storm in certain sections of Texas.

Reforestation and improved soil management are vital problems, not only as methods of flood control, and their wide adoption would have a pronounced influence on the prevailing state of the agricultural and lumbering industries. The correct solution the problems presented by floods can only be obtained by a f and scientific understanding of all the contributing causes flood disasters.

Definite progress also has been made in solving the proble due to soil erosion. The introduction and practice of strip cro ping, more sod and pastures, and terracing have reduced not o soil erosion but have reduced the damage due to floods in so areas. (Ro. St.)

Europe.—Although there have, from time to time, been repo of local flooding in areas of Europe during the year 1940, lit information on any constructive work on flood control was for coming from the belligerent countries. Elsewhere, however, wo on this problem continued on an impressive scale.

Iraq.—The building of the Haifa pipe line brought prosper to Iraq and this prosperity was being wisely used for the ben fit of the agriculturist by a continuation of the policy of che ing excessive flooding in the wet season by the storage of wa for irrigation in the dry. Following the construction of t Kut barrage across the Tigris, works were in progress on the T gris river drainage and the construction of spurs on its two bank the construction of bunds for the protection of the capital agai flood dangers; the canalization of the Gharraf zone; the constru tion of the Yaoo regulator in the middle Euphrates and oth regulators at Ramaitha, Dagharran and Fawar; the constructi of the permanent Diyala weir on the river Diyala for feeding t canals with sufficient water during the low water season and t construction of another branch of the Abu Ghraib canal in t neighbourhood of Baghdad. Investigations were in progress find reservoirs at Tawillah on the Diyala, at Shari on the Tig and at Thartor valley on the Euphrates.

Two other great projects were sanctioned. One was the revival of Shatt el Shamiyah, one of the main branches of the Euphrates, by excav ing the silted river by dredging and the construction of regulators. T second was the revival of the Habbaniyah scheme, put before the Turk government in 1911 by Sir William Willcocks, urged again in 1920 by British authorities and approved in 1940 for execution.

By excavating a channel from the Euphrates near Ramadi to L Habbaniyah the excess waters of the Euphrates during the floods are to drawn off, thus protecting towns and cultivation on the two banks agai inundation. The water thus stored will be diverted back later into river to raise the level during the low season. A second channel from L Habbaniyah to the depression of Abu Dibbis discharges surplus water fr the lake, leaving it relatively empty and ready for any eventuality in following flood season.

India.—The floods which periodically devastate Orissa are principa due to heavy rains in the Central Provinces and, as in Iraq, efforts w being made to divert the surplus water to useful purposes. A special irri tion division was created to erect embankments and a preliminary sur of 15 irrigation works was undertaken, of which four from Sambalpur one from Ganjan were considered to be practicable and paying. The q tion of damming the rivers in these districts was investigated and the provement of Orissa canals and of the Rismikulya system also undertak

From the many studies made of the precise cause of the recurring flo in Bengal, it would appear that the main factor is the misuse of land provinces and independent states far outside her border, whence come many tributaries of the Ganges as well as the Ganges itself.

In the Himalayan region there is no organized forest protection or c servancy of natural vegetation without which it is axiomatic that the tension of floods and the velocity of erosion must get steadily and e rapidly worse. In the plains, where there is much uncultivated waste la the depredations of domestic animals destroy the vegetation. Simultaneo greater volumes of water are trying to rush down from the barren la and the denuded upper catchment area. An interim Ganges flood commi was appointed to tackle a problem which must be solved for the wel of the millions that inhabit the Gangetic plain and which simultaneo appears to be practically insoluble on an adequate scale.

Australia.—In South Australia extensive diversions of the upper wa of the river Murray have led to the flooding of the lakes at its mouth salt water, with resultant heavy loss to the landholders bordering the la and on the reclaimed irrigation area around Wellington. An agreement made for the regulation of the flow of the river Murray and the Goo barrages were the final works being constructed in this connection. T comprise five structures and connecting embankments across the five ch nels leading from Lake Alexandrina to the Murray mouth and are kn as the Goolwa barrage, Mundoo barrage, Boundary creek barrage, I island channel barrage and Tauwitchere channel barrage. During fl periods, approximately 70% of the river flow passes through the Goo channel, 10% through the Mundoo channel and the balance through other three. From the construction point of view the most importan that through the Goolwa channel. (*See* also Dams; Forests; Irrigati Meteorology; Soil Erosion and Soil Conservation.) (J. Eu.

RIVER FRONT of Buenos Aires presented this strange sight of boats seemy anchored in the streets during a flood in the Argentine capital in 1940

CONSTRUCTION of the flood-control project at Middlesbrough, Ky., was completed in 1940

ARTIFICIAL CHANNEL for the Conemaugh river at Johnstown, Pa.—about half complete in 1940—will prevent recurrence of the disastrous floods of 1889 1936

ow: THE MAIN STREETS of Shanghai were under several inches of water in the fall of 1940 as the Yangtze overflowed its banks

Florida, extreme southeastern state of the United States, is called the "Peninsula state" because of its peculiar outline. Its coast line is greater than that of any other state, extending 472mi. along the Atlantic and 674mi. along the Gulf of Mexico. Its total area is 58,666 sq.mi., of which 3,805 sq.mi. are water surface. Florida contains about 30,000 lakes, many of them connected by subterranean channels. Population (U.S. census 1940) 1,897,414. According to this census, the largest cities were Jacksonville, Miami and Tampa, with populations of 173,065, 172,172 and 108,391 respectively. Tallahassee, the capital, had a population of 16,240. For population of other cities *see* CENSUS, 1940.

On distribution of population the latest available figures (state census 1935) gave a total population of 1,606,842, of which 1,139,063 were white and 463,205 Negroes; only about 45,000 were foreign-born. In the 1940 census 1,045,791 were urban and 851,623 rural.

History.—In the 1940 presidential election Roosevelt received 360,407 votes; Willkie 126,412. All five of the state's representatives in congress, and senators Andrews and Pepper are Democrats. Senator Andrews was re-elected in Nov. 1940. Pepper was elected in 1938.

SPESSARD L. HOLLAND, Democrat, elected governor of Florida Nov. 5, 1940

The state elective administrative officers, whose terms expire in Jan. 1945, are: Spessard L. Holland, governor; R. A. Gray, secretary of state; J. Thomas Watson, attorney-general; J. M. Lee, comptroller; J. Ed. Larson, state treasurer; Colin English, superintendent of public instruction; and Nathan Mayo, commissioner of agriculture.

Education.—More than 3,500 students are regularly enrolled in the University of Florida and more than 1,960 in the Florida State College for Women. Municipally operated institutions of learning are: the University of Miami, the University of Tampa and St. Petersburg college. Stetson university and Rollins and Southern colleges are well established privately endowed institutions.

The biennial report of the state superintendent of public instruction showed a total enrolment in the public schools of 396,824, of which 292,959 were in schools for whites and 103,865 were in Negro schools.

State appropriations for higher education for the year 1938–39 amounted to $2,299,760.

Banking and Finance.—The latest available figures on the state's financial condition, taken from the annual report of the state treasurer for the fiscal year ending June 30, 1940, show a total balance in the treasury of $12,121,147.86.

The total bank deposits in Florida national and state banks, on the basis of latest available figures (June 30, 1940), were $451,832,000.

Agriculture, Manufactures and Minerals.—Agriculture is the most important industry in the state. In 1935, the year of the state census, there were 72,857 farms with a total acreage of 6,048,406ac., of which 1,142,767 were in crops, 489,006 were idle (fallow), 2,362,674 were in pasture, 1,140,941 were in farm woodland and the rest mainly in fruit.

The table shows the more important crops for the 1940–41 season.

Important Crops in Florida for the 1940–41 Season

Crop	Acres	Production	Value
Oranges (including Tangerines)	..	29,800,000 boxes	$37,250,000
Grapefruit	..	21,000,000 boxes	21,000,000
Tomatoes	31,500	3,225,000 bu.	7,417,500
Snap beans	52,000	5,090,000 bu.	3,817,500
Celery	7,500	2,280,000 crates	5,700,000
Corn (Maize)	821,000	9,031,000 bu.	5,960,460
Tobacco	16,700	16,123,000 lb.	3,224,000
Irish potatoes	28,000	4,312,000 bu.	5,174,400

On Jan. 1, 1940, the livestock resources of the state were 711,000 beef cattle, 110,000 milch cows, 555,000 swine, 37,000 sheep, 19,000 horses and 41,000 mules. The more important manufactures of the state were lumber, naval stores (turpentine and rosin) and cigars.

In the 12 months' season, April 1939 to March 1940, Florida produced 5,172,550gal. of gum turpentine valued at $1,309,17[illegible] and 345,000bbl. (500lb. each) of rosin valued at $3,360,000. The estimated 1939 lumber output was about 670,000,000 bd.ft. mainly yellow pine and cypress, representing a value of about $21,000,000.

The cigars manufactured yearly in Florida represent approximately $20,000,000; the centres of the industry are Tampa and Jacksonville. Two of the newer industries are the growing of tung nuts and the production from them of tung oil and the making of paper from pine pulp.

The state has only limited resources in minerals, but has large and valuable deposits of phosphates, lime and limestone, and large extensive, though highly valuable, deposits of kaolin and fuller's earth. The annual production of phosphates is valued at about $13,000,000. Florida shares with California a large winter tourist trade and the operation of resort hotels and apartment houses, especially in the southern part of the state, is an extensive business.

Probably the most significant development of 1940 was the building of Camp Blanding, near Starke, which is almost completed, and which will have a capacity for training about 70,000 troops, under the national defence program. (J. M. L.)

Flour and Flour Milling. The year 1940 marked the beginning of a new era in white flour manufacture. Since the advent of vitamin- and mineral-fortified white flour in the British Isles and the United States it can be said more truly than at any time since the introduction of patent flour that "bread is the staff of life." From the moment that Robert Boothby, parliamentary secretary to the ministry of health, announced on July 18, 1940, that the British government had developed plans for the fortification of all bread flour by the addition of synthetic vitamin B_1 (known as aneurin in the British Isles, and as thiamin chloride in the U.S.), flour has taken on a new and greater significance in the nutrition of English-speaking peoples.

In Britain one-fifth of a gram of pure crystalline aneurin to 100 grams of calcium will be added to each sack of flour at the mill. Imported flour, unless previously fortified by the mill according to these specifications, will be likewise augmented before distribution to bakers. Although the cost of aneurin will make this fortification rather expensive, it is expected that large scale production of vitamin B_1 in a plant which should be ready for operation early in 1941 will reduce costs so that the increase of expense in making a two-pound loaf of bread should be about one-tenth of a cent (one-twentieth of an English penny), according to Mr. Boothby's estimate.

In the U.S. one of the outstanding milling organizations

e initiative in offering the bakers a white patent flour con-ning all the principal dietary essentials found in whole wheat. is is accomplished by the addition of organic iron, calcium, osphorus and vitamin B_1 in the same proportions as these bstances naturally occur in the whole-wheat berry. Vitamin B_2 riboflavin is also added in quantities which restore the vitamin vel to that of whole-wheat flour. The interest shown in this w fortified flour in 1940 indicated that other large millers may expected to follow with similarly improved products in the ar future.

While this forward step in flour manufacture has the aspects a wartime measure in the British Isles, it is worth recording at about 1936 research work relating to the addition of vitamin to bread was started by the Millers' Mutual association. Even fore then nutritional research in connection with the fortifica-n of patent flours was undertaken in the U.S.

Investigations of milling problems also turned toward vitamin . "The Thiamin Content of Whole Wheat and Clear Flours" is e subject of a study by C. Hoffman, *et al.*, who found that he thiamin content of clear flours had a definite relation the ash content and varied from 2·0 to 4·7 gamma per gram." rlier work relating to this subject has been published by M. Copping and M. H. Roscoe; A. S. Schultz, Atkin and Frey; R. Williams and T. D. Spies.

Experimental milling methods were studied by Edwin Ziegler, o points out the need for standardization of the experimental lling test. In Ziegler's review of the factors involved in lling it appears that from the experimental standpoint, at st, only a relatively small number of isolated factors have en investigated. In general it appears that commercial prac-e has felt its way along without benefit of laboratory re-arch, and that with the exception of the pioneering work of O. Swanson and J. T. Willard in 1911 relatively little was blished in this field prior to 1925, and not a great deal since en. In his investigations on "The Effect on Diastatic Activ-of Surface, Pressure, Differential and Temperature of the Re-ction Rolls in Milling" Ziegler not only pointed out some sig-icant relationships between the maltose values of flours and lling methods, but also reopened a fertile field for further vestigations in experimental milling. From the chemical stand-int an interesting contribution to recent literature is a study of he Function of the Lipids in Milling and Baking" by B. Sulli-n, who points out that many of the peculiar properties of ughs are related to the lipids which "are either adsorbed, or in mplex formation with the proteins," and that "from 5% to 10% the weight of the gluten is lipid material."

With the launching of new research projects on agricultural oducts at the four new regional laboratories scheduled for the rly part of 1941, it is to be expected that at the northern oratory, at Peoria, Ill., where major attention will be given the products of corn and wheat, a new impetus may be given the investigation of flour and flour-milling problems. (*See* also EAD AND BAKERY PRODUCTS; VITAMINS.)

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luorspar. The chief producers of fluorspar are the United States (32%), Germany (28%), Soviet Union 4%), France (10%) and United Kingdom (8%). The world total is now about 500,000 metric tons. The United States output in 1939 was 173,000 short tons, shipments 182,800 tons, and consumption 176,800 tons, of which the iron and steel industry took 71%, glass and enamel 12% and hydrofluoric acid and its derivatives 15%; other uses are small. (G. A. RO.)

Flynn, Edward Joseph (1892–), U.S. politician who directed the third-term campaign of President Roosevelt in 1940, was born in the Bronx, New York city. He first made the acquaintance of Roosevelt while he was a member of the New York state assembly, to which he was elected in 1918 after graduating from the law school of Fordham university. When he was elected sheriff of Bronx county in 1921 he became political boss of the borough under the tutelage of Tammany Hall. Later he supported James J. Walker for mayor of New York city, and when the latter was elected Flynn was appointed city chamberlain as a reward for his political support. Roosevelt, upon becoming governor in 1929, selected Flynn as his secretary of state, which office he retained under Gov. Lehman until Jan. 1, 1939, when he became U.S. commissioner general to the New York world's fair. President Roosevelt appointed Flynn chairman of the Democratic national committee Aug. 1, 1940, to succeed James A. Farley.

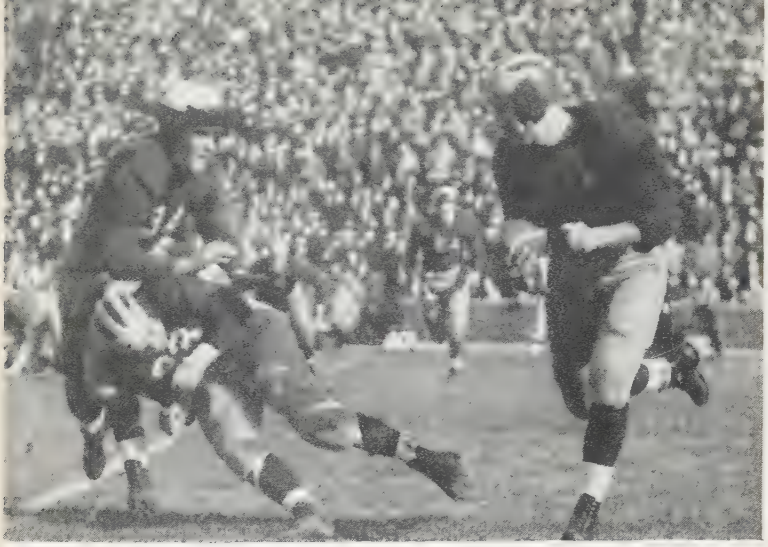
Folk Dancing: *see* DANCE.
Food, Drug and Cosmetic Laws: *see* ADVERTISING; CANNING INDUSTRY; DRUGS AND DRUG TRAFFIC.
Food Prices: *see* AGRICULTURE; PRICES.

Football. With the east and the middle west heading the parade, both in the number of strong teams and the attendance figures, intercollegiate football enjoyed a flourishing season in 1940. The nation's first peacetime conscription may make heavy inroads on the sport in 1941, but in 1940 there was no letdown either in the quality of the play or the public's interest. The usual big crowds turned out each week, in spite of the country's concern with the war in Europe and the bitterly contested presidential election. The dropping of football by the University of Chicago at the close of the 1939 season failed to set a trend, as had been predicted, though some significance was read into the statement by Yale's athletic head committing Yale to a continuing policy of de-emphasis regardless of how badly its teams fared on the gridiron.

Apparently there is little immediate prospect of any general deflation in college football so long as the sport continues to carry the burden of the entire athletic structure at most institutions of learning.

The public's interest and support of the sport is reflected in the gathering of 102,000 that filled Philadelphia's Municipal stadium to see Navy defeat an Army eleven that had not won a major victory since 1938. Pennsylvania and Cornell, meeting for the Ivy league honours, attracted 80,000 to Franklin field, Philadelphia, where Frank Reagan closed out his career by leading Penn up from a 13–0 deficit to victory in one of the many thrilling games of the season.

On the same day, Stanford university, the surprise team of the year, defeated California before 80,000 at Berkeley, to win the Pacific coast championship and the Rose Bowl nomination. Army and Notre Dame played to 78,000 at the Polo Grounds in New York, and 73,000 saw Tom Harmon, the college player of the year and winner of the Heisman trophy, wind up his varsity career in the Ohio State stadium by breaking the 15-year-old scoring record of Red Grange. Notre Dame played to approximately 500,000 in nine games and Pennsylvania was close to that figure for eight games.



TOM HARMON, outstanding football star of 1940, making a gain for Michigan against Yale at Ann Arbor on Oct. 28, with the help of perfect blocking

Minnesota was ranked as the No. 1 team of the year in a national poll of sports writers. The Gophers went through one of the most exciting schedules of the season without being defeated or tied, although in two instances, against Michigan and Northwestern, their margin of supremacy was a point after touchdown. Their conquests included Washington, the second best team on the Pacific coast, Nebraska, the champions of the Big Six, and Ohio State, the 1939 champions of the Western conference, whom Minnesota succeeded. Behind Minnesota were ranked Stanford, whose coach, Clark Shaughnessy, serving his first year at Palo Alto after leaving Chicago, was rated as the coach of the year, Michigan, Tennessee, Boston college, Texas A. & M., Nebraska, Northwestern, Mississippi State and Washington.

Stanford, Tennessee and Boston college won all their games, as also did Lafayette college. Tennessee completed its regular schedule for the third successive season without being defeated or tied and carried off the Southeastern conference title again. Boston college was ranked the No. 1 team of the east. Michigan lost only to Minnesota, as also did Nebraska. Mississippi State was unbeaten but tied by Auburn; Northwestern lost to Minnesota and Michigan; and Washington to Minnesota and Stanford.

Texas A. & M. was regarded by many as the equal of any team in the country until, in its closing game, it met with a shocking defeat by Texas, despite the powerful smashing of its great fullback, John Kimbrough. The Aggies finished in a tie with Southern Methodist for the Southwestern conference honours but lost their chance to go to the Rose Bowl.

Stanford invited Nebraska as its opponent in the Rose Bowl at Pasadena and finished the season undefeated with a score of 21–13. Tennessee and Boston college met in the Sugar Bowl at New Orleans with Boston college defeating Tennessee 19–13. Fordham, one of the best elevens in the east, which lost only to St. Mary's, played Texas A. & M. in the Cotton Bowl at Dallas, with Texas winning, 13–12. In the Orange Bowl at Miami, the opponents were Mississippi State and Georgetown, which lost only to Boston college, by 19–18, in one of the outstanding games of the year, marking Georgetown's first defeat since 1937. The Orange Bowl winner was Mississippi State, 14–7.

Cornell and Notre Dame were two teams that ranked high for a good part of the season, only to topple finally. Cornell was the No. 1 team of the country for four weeks and then suffered the most shocking reversal of the year under unparalleled circumstances.

Unbeaten in 18 games, the Ithacans went to Hanover, N.H., to play a Dartmouth eleven that had lost four times. On the last play of the game, Cornell threw a touchdown pass and apparently won by 7–3, but two days later the moving pictures of the game established that the pass had been scored on an illegal fifth down. The referee, W. H. Friesell, admitted his error and Cornell, of its own volition, conceded the victory to Dartmouth by 3–0, the first time on record a score had been reversed in college football.

Notre Dame, fancied to have its best team in many years, disappointed in defeating Army only through an intercepted pass and in losing to Iowa and Northwestern.

There were no innovations of attack or defence in 1940. The forward pass was used more extensively than ever.

Professional football likewise enjoyed big favour. The Polo Grounds was jammed with 55,000 people when Brooklyn defeated New York, and thousands were unable to gain admittance to the play-off between the Washington Redskins and the Chicago Bears for the national championship at Washington. The Bears won by the staggering score of 73–0, the worst rout in the history of the play-off.

Dr. Jock Sutherland, serving his first year in professional football, the coach of the year in bringing Brooklyn up to second place in the eas standing. Davey O'Brien, playing his last game for the Philadelphia Ea before forsaking football for a career in the federal bureau of investiga set a record with 33 completed passes against Washington.

Canada.—In spite of the war, football continued to be played in dominion, although intercollegiate competition was abandoned and pla left their teams to join the colours. The east-west final for the champ ship was not held.

In lieu of this play-off, the championship of the C.R.U. was decide the eastern series between Ottawa Rough Riders, interprovincial titlehol and Toronto Balmy Beach, which won the championship of the Ont Rugby Football union for the first time in a decade by defeating Sa 2–26th Battery, successor to the Sarnia Imperials. The Rough Riders from Balmy Beach to win the C.R.U. crown. The Winnipeg Blue Bom who defeated the Rough Riders in the 1939 east-west dominion champ ship play-off, won the Western Interprovincial Football union hon again, vanquishing the Calgary Bronks in the play-off. (A. DA

Great Britain.—There was plenty of football of all kinds played in season 1939–40, Rugby union, Rugby league and association, in spit the difficult conditions. In the Rugby union world the game was so organized as the season advanced that it was possible to play a coupl international matches between England and Wales and a couple of unive matches. The international matches were played at Cardiff and Glouce and England won them both, fairly easily, too. On the England side H Cranmer left his accustomed position in the centre and played at full F. G. Edwards (Gloucester) took Cranmer's place in the centre in matches and played splendidly each time, his marking of Wilfred Wo making England's task very much easier. T. A. Kemp and the ubiqui J. Ellis made a capital pair of halfbacks.

The first university match was played at Cambridge, and Oxford w easily, thanks mainly to their brilliant backplay, where G. A. Hollis captain) and R. E. Luyt made a very good wing indeed. On pape looked as though Oxford would do the same in the return match, and did until half time, but then C. L. Newton Thompson, the Cambr captain, pulled his forwards together and led them superbly to beat Ox just on time. E. R. Knapp scored all the four tries that Cambridge obta in the second half.

There was a memorable match played in Paris between the British a captained by the Irish international, H. J. Sayers, and the French a This was the strongest Rugby side that ever left British shores and e man was at his best. So it is no wonder that the French side was badly beaten. Here is the full British army side: V. G. Jenkins (Wa E. J. Unwin (England), P. Cranmer (England), W. Wooller (Wa R. H. Guest (England), F. J. Reynolds (England), J. Ellis (Engla W. E. N. Davies (Wales), W. H. Travers (Wales), R. E. Prescott (land), G. B. Horsburgh (Scotland), T. F. Huskisson (England), R Mayne (Ireland), S. Walker (Ireland) and H. J. Sayers (Ireland). outstanding club of the year was St. Mary's hospital, which T. A. K captained. Among those who have been killed in active service in 1940 who were famous in the Rugby union game, were A. Colensky, P. Co B. H. Black and E. J. Parsons, all four English internationals and the three Oxford blues as well.

The Rugby league game functioned, too. All the well known clubs sides, both in Lancashire and Yorkshire, and the Lancashire cup final won by Swinton, which beat Widnes after extra time had been played. was as much association football played as ever, if not so intensively stead of the ordinary leagues, regional competitions were held, En (with Wales) having eight regions and Scotland two, while Ireland on as much as usual. Two international matches were played, En drawing with Scotland (1–1) at Hampden park, Glasgow, and losi Wales at Wembley by a goal to nil. (D. R. C.)

Foreign Exchange: *see* EXCHANGE CONTROL AND EXCHA RATES.

Foreign Investments in the United States.

Foreign investments in the United States, long- and short-t were estimated at $9,462,000,000 as of the end of 1939. was an increase of $800,000,000 during the year, the net $1,000,000,000 increase in foreign short-term deposits in Un States banks and a $200,000,000 decrease in foreign holding United States common and preferred stocks. As a consequen those conflicting trends, short-term assets comprised over third of the total foreign dollar assets whereas one year e they were less than one-quarter of the total.

Common stocks comprised, at the end of 1939, approxima 40% of the foreign long-term investments. Holdings of com stock have usually been the principal fluctuating element in eign investments. That is partly because common stocks valued on the basis of their market prices in investment mates. Equally important, however, is the popularity of com stocks as speculative media.

The increase in long-term investments in the United S during the last five years was stimulated primarily by the

ects of sharing in the benefits of relative prosperity in the nited States, and by the desire to escape the periodic political rises and threats of war in Europe. Under those circumstances vestments in common stocks naturally exceeded other types. he other types of investments—direct, preferred stock, bond nd miscellaneous investments—changed relatively little in value, artly because of the bases of valuation and partly because they e not speculative types of investment.

Foreign Investments in the United States by Types of Investments, 1938–39
(Year-end data: in millions of dollars)

Types of Investment	1938	1939
Long-term investments:		
Direct investments (book value)	1,895	1,935
Common stocks (market value)	2,715	2,493
Preferred stocks (par value)	530	499
Bonds (par value)	580	570
Miscellaneous investments	750	750
Total	6,470	6,247
Short-term investments:		
Total	2,193	3,215
Grand total	8,663	9,462

Source: Long-term data from Finance Division, Economic Series No. 8, *The Balance International Payments of the United States in 1939.*
Short-term data from *Bulletin* of the Treasury Department, as adjusted in *The lance of International Payments of the United States in 1939.*

Over 37% of the foreign long-term investments in the United ates at the end of 1939, or $2,348,000,000, was British and %, or $1,060,000,000, was Canadian. The next largest investents were Dutch ($888,000,000) and Swiss ($746,000,000). elatively, all of the others were quite small, notably Germany nd Italy with investments totalling $100,000,000 and $40,000,000 spectively. Latin America, Asia, Africa and Australia comned had investments in the United States totalling only $312,-00,000. Stocks and bonds, that is readily marketable securities, mprised $1,180,000,000 of the British long-term assets in the nited States at the end of 1939. Similar assets comprised 519,000,000 of the Canadian investments and $767,000,000 of e Belgian and Dutch holdings. The other assets, although very aluable, were not as readily liquidated and, therefore, of more stricted usefulness.

Foreign countries were net sellers of United States securities uring 1939 and during the first eight months of 1940. The nited Kingdom and Canada made net sales in the amount of 175,000,000 in 1939, followed by sales of $72,000,000 from nuary to Aug. 1940. Belgium, Netherlands, Switzerland and the candinavian countries were heavy net buyers, their purchases ducing the net sales for the world to $108,000,000 and $32,-00,000 during the respective periods.

Foreign short-term funds in the United States increased pidly in 1939 through August, the beginning of the war. This flux of foreign funds was particularly rapid during and after e March crisis occasioned by the German occupation of Czechovakia. The increase in foreign central bank and government lances in United States banks was especially large and significnt. These developments were traceable, of course, to the growg realization that war was inevitable.

After the war started there were two contrary movements in ort-term investments, similar to the movement of United States curities. Belligerent countries were rapidly reducing their balces as part of their war effort. Britain, France and Canada, ing unprepared for war, compared with Germany, were forced expand their military machines to a very considerable extent rough the purchase of planes and other equipment in the nited States. The dollars with which to pay for these war purases were obtained principally by selling part of their gold serves and current gold production to the U.S. At the end 1939, Britain, France and Canada had $455,000,000, $297,000,-0 and $288,000,000, respectively, short-term balances.

Neutral European countries increased their deposits in United States banks in 1939 and through Aug. 1940 as part of their efforts to protect their capital assets. Even the central banks shipped substantial portions of their gold reserves to New York. Some of this gold was sold and the proceeds deposited to their accounts and some was earmarked at the Federal Reserve bank of New York.

At the time of the war of 1914–18, the mobilization of privately owned foreign assets by the European belligerent countries was not started for at least a year and was not made obligatory until Feb. 1917. Upon the beginning of war in 1939, the British and French empires took steps promptly to ensure that the foreign exchange and other assets of their subjects and citizens were conserved. This was done, (1) by ordering the registration of all such assets, (2) by requiring that all transactions in those assets be licensed, and (3) by providing the machinery for the seizure of the securities and other assets by the governments. United States securities were requisitioned by the British government on two dates during the first year of the war: Feb. 17, 1940 when 60 selected corporate stocks were ordered turned over to the Bank of England and on April 13 when 92 stock and 23 bond issues were similarly called. Neither any of the dominions nor France had requisitioned any securities during 1940. Sales under these requisition orders were very small as was shown by the statistics of net sales.

A new policy affecting foreign investments in the U.S. was adopted by the government of the United States at the time of the invasion of Denmark and Norway. On April 10, 1940 an executive order was issued providing that transfers of credit, foreign exchange transactions, the export or earmarking of coin, bullion or currency, and other similar operations by persons or institutions in the United States, which involved Danish or Norwegian property, should be subject to licence by the secretary of the treasury. Similar executive orders were issued at the time of the subjugation of Belgium, Netherlands, Luxembourg, France, Latvia, Estonia, Lithuania and Rumania.

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(P. D. D.)

Foreign Missions. During 1940 the progress of the wars in Europe and the far east brought increased problems to Christian foreign missions. In the British empire and in the Netherlands East Indies the intensification of the struggle led to a more thoroughgoing internment of German missionaries than in the earlier stages of the conflict. Direct contacts were broken off between the supporting constituencies in several countries and their missionaries. This was true of the Germans, the Dutch, the Danes, the Norwegians, the French and the Belgians. In Great Britain heavy taxes and the evacuation of the members of scores of parishes, with the consequent disruption of normal church life, caused a decline in contributions to missionary societies. Difficulties in procuring foreign exchange hampered the transmission of funds. Christians of the United States were appealed to for increased giving to make up for the decline on the other side of the Atlantic. For the Protestants, the offices of the International Missionary council served as a channel for communication between missionaries and supporting constituencies who otherwise were cut off from one another and raised and transmitted funds to supply the needs of the "orphaned missions." In Japan the accentuation of national spirit attendant upon the hostilities with China was accompanied by enhanced government control of the churches. The various Protestant bodies were constrained to take steps toward union. Because of national feeling, foreign subsidies to Japanese churches

were ordered discontinued and foreigners in executive positions were to be replaced by Japanese. Pursuant upon rising friction with Japan, the government of the United States advised its citizens in the far east to consider returning home. This led to the evacuation of many of the missionary staff from Japan, Chosen and China. Yet among the Chinese, missionaries and Christianity were in higher favour than ever before. In no land did missions cease in 1940. Means were found to continue them, even though in some regions with altered programs. (K. S. L.)

Foreign Trade: *see* INTERNATIONAL TRADE.

Forests. **United States.**—Public hearings held early in 1940 by the Joint Congressional Committee on Forestry—and testimony presented at those hearings by representatives of the general public, of forest industries and forest owners, and of community, county, state and federal governments—were significant. For testimony before this committee brought out that the best three-fourths of United States commercial forest land is in private ownership and that exploitation is still the rule whenever most private lands are operated. It also emphasized that the United States is still cutting, wasting and destroying old-growth and second-growth forests faster than it is producing usable new ones; and that although private forest lands most in need of rehabilitation coincide in general with areas of greatest rural unemployment, the United States has scarcely touched the work opportunities these and other forest lands afford.

From 1930 to 1940 congress passed many fundamental laws affecting lands within fences on farms; lands for which a comprehensive nationwide land-use program was in 1940 well under way. This helped turn the tide away from soil depreciation. It also helped agriculture deliver its full quota of food toward national defence and national safety. In the field of forestry, piecemeal legislation has been enacted in the past. But most current forestry action programs are inadequate and there was in 1940 urgent need for a more comprehensive and up-to-date one.

Endorsed by the department of agriculture, such an over-all program was recommended to the Joint Congressional Committee on Forestry by the federal forest service. Its purpose is to create and maintain a nationwide forest economy that will help solve problems of rural poverty and unemployment and create security and stability for those families, communities, regions and industries that depend upon the forest resource.

The first and major section of this recommended program centres on private lands. This is because they are the crux of the situation. Applied concurrently, the two parts of this section provide for (a) co-operation—effort and action by private owners as well as by public agencies, *including* public control as one of many co-operative aspects—and (b) extension of public—community, state and federal—ownership and management of forest lands.

The second section of the recommended program is designed to provide for protecting, developing and using forest land and its resources in public ownership and management—including the present national forest system—and those which come into public ownership and management. The third section has to do with more adequate provision for research with respect to private and public forest lands and their resources, and services—such as watershed protection, outdoor recreation and wildlife conservation—that forests render.

This recommended program pointed toward achieving sustained yield of the forest resource. It will not accomplish this purpose immediately. But it charts the course and proposes movement along that course as fast as possible.

Another significant forestry achievement during 1940 was the sale, under one contract, of 425,000,000 board feet of softwo lumber that had been salvaged, by forest service direction, si the New England hurricane of Sept. 1938. This contract, ma after full exploration of possibilities of selling direct to natio defence agencies, and after reserving salvaged timber for lo industries, provided that the price to be paid under it shall adjusted to its actual market value every 90 days. Besi ensuring receipt of full market value, this may help ma possible additional payments to farmers and others who origina owned the timber.

Another significant development during 1940 was the dropp of trained men and equipment from aeroplanes, by parachutes, forest fires in rough and mountainous national forests in west. In these operations, which make it possible to put ma fires out more quickly, planes first release small parachutes determine drift. Trained men follow. Using parachutes wh permit a certain amount of steering, they carry lightweight rad with which they quickly get in contact with planes and he quarters. Tools, first-aid kits, and emergency rations are attach to separate burlap parachutes.

The national forests in 1940 totalled 176,567,095ac. of fede land in 42 states and 2 territories. They protect huge porti of many major streams and furnish domestic water supplies more than 400 cities and towns. At least 85% of all major wa ern irrigation projects are dependent upon water from natio forests. They are also the source of about one-third of the natio potential water power, harbour approximately one-third of nation's big game and provide an enormous area that can be u for recreation.

National forest properties in 1940 had about one-third of commercially valuable saw timber of the U.S. Most of it is l accessible than privately owned timber, but this public resou is being built up through a planned program that includes tensive protection, planting, stand improvement, and enforcem of such cutting practices as will assure perpetuation of the source. When all national forest timber is under management a protection it should be able to provide, on a permanent ba for an annual cut at least five times as much as that of 1940

Sale of national forest timber, greater in 1940 than dur any previous year, is but one of many activities aimed at spec social and economic needs. Others include: Regulating livest grazing; determining ways to increase returns from farm wo lots; planting of shelterbelts to improve living conditions in prairie plains region; and developing recreational facilities low-income groups.

On the national forests these recreational facilities in 1 included some 4,000 campgrounds. The forest service has a made a definite start toward developing "organization camp which are made available to such public welfare and other orga zations as the Boy Scouts, Girl Scouts, Camp Fire Gi Y.M.C.A., Y.W.C.A., 4-H clubs, Salvation army, and to chur fraternal, farm and labour organizations. The chief purpose is provide health-giving outings for people who are less well-to and for children. (E. H. CL.)

British Empire.—The war in 1940 had a very great effect on fores in the empire. All other forestry activities had to be subordinated to production of timber and other supplies required by Great Britain for prosecution of the war. The spread of war to northern Europe cut off tr with Russia, the Baltic states and Scandinavia which provide in peacet a large proportion of the imports of timber. Control of timber supp was instituted at the start of the war and strenuous efforts were made increase the volume of supplies of home-grown timber and, so far as sh ping was available, to increase imports from North America, especia British Columbia. With the active co-operation of the timber trade forest departments in Canada, supplies were being turned out at a stead increasing rate and all previous records of outturn from British Colum were exceeded.

Forest officers and woodmen from Great Britain, Canada, Australia, N Zealand and Newfoundland were drafted into a forestry corps as part of regular army. Before the capitulation of France they operated mainly

at country, but were subsequently employed on the extraction and conersion of timber for war purposes in Great Britain.

The preservation and improvement of forests necessarily had to give way r a time to measures connected with the prosecution of the war. Staffs ere seriously depleted of officers, both for active service with the forces nd for special work in connection with war timber supply. Nevertheless forts were being made in Great Britain as elsewhere to replace forests exoited for war purposes so far as staff and funds would allow.

There can be little doubt that the great increase in public interest in npire forestry which followed the World War of 1914–18 will be repeated hen peace is once more obtained. Among other vital questions that will ave to be tackled in Great Britain, as in some of the self-governing dominions, is the position of private forests. Even before the war this was ecoming a matter for discussion, and the partial denudation of private orests, which the satisfying of war requirements must lead to, will result a further call for state control of reforestation and of the management these forests. (*See* also LUMBER.) (H. R. BD.)

ormosa (TAIWAN), a large island in the western Pacific, between the east and south China seas, separated rom the northernmost of the Philippine islands by the Bashi nd Balintang channels; area 13,429 sq.mi.; capital Taihoku; opulation (1937) 5,609,042, of whom 299,280 are Japanese. Iost of the inhabitants of Formosa are of Chinese stock and are acially akin to the inhabitants of the neighbouring Chinese oastal province of Fukien. There are some aboriginal tribesmen in ne interior of the island. Formosa is the oldest Japanese colony. was annexed after the war with China in 1894–95. The present overnor-general is Admiral Seizo Kobayashi and the Japanese avy has a special interest in the island from a strategic standoint, as there is an important naval base at Mako in the Pescaores, islands off the western coast of Formosa. Penalties of ne and imprisonment have been inflicted upon the masters of oreign ships which have entered the port of Mako during storms. he supreme authority in Formosa is the governor-general, who is sisted by an advisory council, the majority of whose members e Japanese. A good deal of Japanese capital has been invested Formosa, especially in the sugar industry; the fertile coastal ains of the island (the interior is wild and mountainous) also oduce tea, pineapples, camphor and citrus fruits, and there are tensive rice plantations. Formosa's exports in 1938 amounted 456,454,000 yen, imports to 366,659,000 yen. More than 90% its foreign trade was with Japan. The most important Forosan exports to Japan and its colonies in 1938 were sugar 77,596,000 yen) and rice (126,907,000 yen). As the agricultural resources of the island have been pretty thoroughly developed there has been a tendency to concentrate on the development of hydroelectric power and of the spinning and chemical dustries. Part of Formosa was under Dutch rule from 1624 ntil 1662 and old remains of forts and other Dutch buildings are be found in the vicinity of Tainan, in southern Formosa.

(W. H. CH.)

ort Peck Dam: *see* DAMS.

oundations: *see* DONATIONS AND BEQUESTS and Foundations nder their specific names.

our-H Clubs. More than 1,400,000 rural boys and girls were enrolled in 78,600 local 4-H clubs in 1940. f this membership, more than 600,000 were between the ages of and 21. These clubs were located in practically every county the states and territories of the U.S. They were conducted by ounty extension agents co-operatively employed by the state nd-grant (agricultural) colleges, the United States department agriculture and the counties concerned, as a part of the proam of co-operative extension work in agriculture and home conomics. Assisting in the 4-H club work were volunteer local aders, usually local farmers and homemakers, more than 104,00 of whom served the young people of their communities in is capacity in 1940. In addition, more than 43,000 older 4-H ub members carried some leadership responsibilities for their clubs. To train these volunteer leaders for their work with the 4-H clubs, extension agents and subject-matter specialists held nearly 30,000 leader-training meetings during the year. The 4-H clubs are organized usually on the community basis, but in some states they are organized according to the special interests of the members—their interests in corn, dairying, gardening, etc. Each club elects its officers from its own membership and in a number of states federates with other 4-H clubs in the county through a county council of 4-H members or county 4-H officers. A few states also have a state federation.

National 4-H club events were: the national 4-H club camp, held in Washington, D.C., June 12–19, attended by four 4-H club delegates from each of 43 states and Puerto Rico; the 4-H division of the National Dairy exposition, held Oct. 12–19 at Harrisburg, Pa., in which about 160 4-H club boys and girls representing some 40 states participated; and the National 4-H Club congress held in Chicago, Ill., Nov. 29–Dec. 6, attended by 1,600 4-H club members representing 44 states.

(M. L. W.)

France, a republic situated in the west of Europe; bordered N. by Belgium and Luxembourg, N.E. by Germany, E. by Germany and Switzerland, S.E. by Italy, S. by Spain, with the Mediterranean sea on its southeast coast, the Atlantic ocean on the west, and the English channel and the North sea to the north. Area, 212,736 sq.mi.; population (est. June 1938), 41,980,000. Chief towns (pop. 1936): Paris, 2,829,746; Marseilles, 914,000; Lyons, 571,000; Bordeaux, 258,000; Nice, 242,000; Toulouse, 213,000; Lille, 201,000; Nantes, 195,000. Language, French; religion, Roman Catholic; *c.* 1,000,000 Protestant.

History.—The year 1940 opened for France with the Daladier government apparently enjoying general support, but undercover hints of dissatisfaction were not lacking. Opposition centred largely in two elements: on the right, appeasers and defeatists; on the left, soviet sympathizers.

It was with this latter group that the government first dealt. The chamber passed a bill Jan. 16 excluding communists, with the exception of those who had by Oct. 26, 1939 repudiated the Communist party. This affected some 62 deputies. The one communist in the senate, Marcel Cachin, was expelled Feb. 21. Meanwhile, outside parliament leading communists in Paris were being arrested and several thousand others purged from the lists of municipal, district and departmental councillors.

Dissatisfaction with Daladier's policy was rapidly spreading beyond the ranks of communists and appeasers. On Feb. 9, the chamber, led by Blum, overrode Daladier's opposition and voted for a two-day secret session dealing with war policy. What transpired in debate is unknown, but apparently Daladier was able to satisfy his critics, for the session closed with a very large vote of confidence. Nonetheless the chamber emerged with a new sense of its importance. Attacking the government's censorship policy as "incompetent and partial," it forced Daladier on Feb. 27 to create a ministry of public information which was to co-ordinate services in the fields of information, broadcasting, propaganda and censorship.

The reports of the minister of finance, Reynaud, and the high commissioner of national economy, Serruys, reflected satisfaction in the condition of finance and industry and concern with preparing France for a long war. Reynaud could report that the interest rate had remained low and that the treasury had not expended all the money at its disposal. Serruys was chiefly concerned with avoiding a deficit in France's foreign trade balance and to this end favoured economy at home and increased production for export. Plans were being made with Great Britain to capture the former markets of Germany, Austria, Czechoslovakia and

Poland. In order to increase production, colonials were being imported to replace men mobilized in the army. And to aid economy, decrees passed Feb. 29 provided for the rationing of food and gasoline and for the prevention of price increases under the control of a national price committee.

The news of Finland's capitulation brought to a head the opposition in parliament to the government's policy of a defensive war. The senate demanded a secret session, and though the session closed March 14 with a vote of confidence, that vote was made conditional on the successful continuation of the war. A few days later came the news of the Brenner pass meeting of the axis leaders. This led to a secret session of the chamber on March 19, ending in a vote of 239 in favour of the government, with 300 abstaining.

Daladier resigned.

Within 24 hours Reynaud, the former finance minister, had formed a new cabinet, a compromise granting more posts to the Socialists at the expense of the Radical Socialists and the Republican federation of the right. The vote on the new government gave Reynaud a majority of only one vote, but he decided to carry on and attempt to win parliament's support. In contrast to Daladier's weak and unspectacular war policy, he promised an energetic waging of war in all fields, industrial, diplomatic and military.

The new government included ex-premier Daladier as minister of national defence, while Reynaud added to his former responsibilities at the finance ministry the duties of premier and foreign minister. Despite its compromise nature, Reynaud's government met strong opposition: in the senate, where Laval was building up a following; and in the chamber, where Bonnet, discarded as a one-time appeaser, was marshalling the Radical Socialists.

With the beginning of the campaign in Norway, April 9, Reynaud's position was temporarily strengthened. Both senate and chamber, impressed by the danger, offered him a free hand and large votes of confidence. News of the Norwegian fiasco, which reached France on May 2, reversed the situation, and the government survived only by bringing two members from the right wing into the cabinet—Marin of the Republican federation and Ybarnegaray of the French Social party.

Then on May 10 the great German offensive was unleashed against the western powers. In the face of mounting disaster, Reynaud himself took over the war ministry, Daladier was given the foreign ministry and only nominal control of that, Pétain was called in as vice-president of the council of ministers and chief advisor on military matters, and Mandel became minister of the interior. But this infusion of new blood was insufficient to avert catastrophe. Germany's offensive was resumed against France on June 5, and in a last effort to achieve unity Reynaud set up a cabinet on a very broad base. Daladier at last was dropped. Reynaud resumed the foreign office but devolved large responsibilities upon Paul Baudouin who became his chief lieutenant. General Charles de Gaulle was given a similar role in the war office which Reynaud also retained.

Marcel Bouthillier relieved Reynaud of his functions at the finance ministry.

These cabinet shifts could not save France. On June 10 Italy entered the war, and by the second week of June the Germans were in Paris. The government had fled, first to Tours and then to Bordeaux. Here they paused to continue the debate begun in Paris. Should France capitulate? Reynaud led the minority favouring "war to the finish," and sent a series of appeals to the United States and Great Britain for immediate aid. Roosevelt could offer nothing concrete, and Churchill, though impressed with the seriousness of the situation, could get from his cabinet only the statement, on June 13, that Britain would accept any decision the French government might make, but that in any case it would continue the war. On June 17 the British foreign office issued a draft made the previous day by which a complete and "indissoluble union" of the French and British empires was offered. Too late. Already on June 16 the French cabinet had held a series of three meetings. Reynaud, supported by de Gaulle and Mandel, favoured continuing the war; but he was overridden by the opposition. Pétain, Weygand, Baudouin and Chautemps preferred to gamble on peace.

That evening Reynaud resigned, and a new era began for France. Pétain, the 84-year-old victor of Verdun, headed the cabinet of surrender. There was no delay. On June 17 the new premier broadcast that France was seeking peace. Via Franco's Spain, the message was conveyed to Hitler. The following day at Munich, Hitler and Mussolini discussed the fate of France. Then the call went out summoning France's envoys to Compiègne, historic site of the armistice 22 years previous. Here, on June 21 and 22, negotiations were carried on, resulting in the signature of armistice terms.

On the 24th in Rome, Italy's armistice terms were accepted, and on the 25th firing ceased.

According to the terms of the armistice, all French territory in a line from the Swiss frontier near Geneva to a point 12 miles east of Tours and thence southwest to the Spanish frontier at St. Jean-Pied-de-Port was to submit to German occupation; French naval, military and air forces were to be demobilized; all munitions of war were to be given up; in occupied areas, land and coastal defences and plans of forts were to be handed over; the French fleet was to be demobilized and disarmed under German or Italian control, except that part necessary for the protection of the colonial empire. Germany agreed to use none of this fleet for purposes other than those of coast surveillance and mine sweeping; provisions were made as to the disposal of French aerodromes, ports and navy yards. (*See* also EUROPEAN WAR.)

The explanation for the sudden and overwhelming collapse of French resistance has remained a matter of dispute and bitter recrimination. One fact is obvious. Militarily France was defeated by a far superior army. Striking at a vulnerable spot and moving with amazing speed, the Germans never gave the French an opportunity to organize a defence. Their army showed an overwhelming superiority in man power, mechanized equipment, aeroplanes, and, above all, the ability to co-ordinate the various arms into a bewildering and sustained attack. The French generals, building on the experience of the war of 1914–18, relied too heavily on a static defence, epitomized by the costly Maginot line. More difficult to explain was the lack of preparedness, measured not only in lack of tanks and planes, but in lack of a unified public opinion. While Germany had been feverishly preparing for war, France had been torn by internal dissension. There was a considerable element in the French parliament which favoured appeasement even after the war had begun, and this sentiment dominated the new Bordeaux government—soon moved to Vichy. It was composed of diverse elements including Pétain, Bouthillier, Frossard, Ybarnegaray, Weygand, Laval, Marquet, Chautemps and Baudouin. Not all these men were "rightists," but almost all had been identified with the policy of appeasement.

From the outset the new government was at odds with its former ally. General de Gaulle, Reynaud's coadjutor at the war office, fled to London where he established a French national committee, pledged to the energetic continuance of the war against Germany. The British supported the de Gaulle movement, while refusing to recognize the Pétain regime. The situation was further strained when the British, alarmed by the terms of the armistice

ided to take action to pre-
nt the French navy falling
o German hands. On July 3
y successfully obtained the
render of a number of
ench ships which had taken
uge in British harbours,
l later, when a large unit
the French navy, stationed
Oran, Algeria, refused to
itulate, a costly battle en-
d, ending in the destruction
several French ships and a
ge loss of life. This left the
ench with a diminished but
l powerful fleet stationed at
ulon. However justifiable
m the British point of view,
episode embittered the feel-
s of many Frenchmen and
engthened the pro-German
nings of the Pétain govern-
nt. On July 5 the latter de-
ed to break off relations with
tain.

The new regime was faced
h problems almost insur-
untable under the most fa-
rable conditions. Though it
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trol over all of France, in
ctice the German govern-
nt completely controlled
-thirds of the country, in-
ding all the Atlantic coast;
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st of the industrial and min-
areas; and nearly all the
in-producing areas. Some
000,000 refugees had to be
atriated, the portion of the
ny not held as prisoners by
Germans demobilized, and
German army of occupation
ported at a set cost of 400,-
,000 francs a day. In a
ntry ravaged by war and bewildered by defeat these drastic
blems had to be solved by a government held in suspicion
many Frenchmen and forced to co-operate with the victors.
Pétain's first step was to provide a new constitution which
uld give more power to the chief executive. This was author-
d by the chamber and senate July 9, and ratified by the na-
nal assembly July 10, on the basis of a draft drawn by Laval
d a committee. On July 12 Pétain proclaimed the new organic
by which he succeeded Lebrun as head of the French state,
nbining the offices of president and premier. He was given full
islative powers until such time as a new parliament should be
ganized and, thereafter, legislative decree powers in times of
ergency, of which occasions he was to be judge. He also re-
ved complete treaty-making power, military and appointive
wer. The executive was supplemented by a government of 12
nisters. Parliament was to be merely a consultative body.

The new France repudiated completely the third republic's

ADOLF HITLER looked down pensively on Napoleon's crypt in Les Invalides, Paris, June 24, 1940, ten days after the fall of the French capital

basic principles of parliamentary government and individual freedom. For the "false idea of the natural equality of men," Pétain promised to substitute "a society based on a hierarchy of ability and service to the state." For the French revolution's slogan of "liberté, égalité, fraternité," he substituted "travail, famille, patrie." It appeared that France would enter the new European order as another "totalitarian" state.

One step in this repudiation of the past was the decree of July 29 setting up a court of seven judges to try the cases of those held responsible for France's defeat. The court met at Riom, Aug. 8, and was given a list of the accused, composed of: Daladier, Reynaud, Blum, Delbos, Campinchi, Mandel, Cot and Gamelin. A military court had already condemned de Gaulle to death on Aug. 2. Although receiving considerable publicity, the Riom court had rendered no formal judgments by the end of 1940.

The doctrines of right-wing French nationalists found expression in many acts of the new government. A semimilitary youth movement was organized, and sports and "national" history were given a larger role in education. A beginning was made in the repeal of anti-clerical legislation (dating from before the war of 1914–18), and measures were passed to strengthen family life and increase the birth rate. Action was taken against liberals, aliens, Jews and all supporters of "international ideas," beginning with a purging of the press in July. Jews were discriminated against, though they received much better treatment in unoccupied France than in areas under German control.

The first steps toward building a corporate organization of industry and labour were taken, with the state assuming extensive control over various aspects of economic life, including the fixing of prices and wages. As part of the program of collaboration with industrial Germany, agriculture was encouraged at the expense of industry. The serious financial situation of the government hindered public works projects aimed to relieve the serious problem of unemployment. All gold securities and foreign exchange in the occupied area were seized by the reich, June 22, and the Bank of France put under the control of a German official. The franc was pegged at 20 to the mark, but the reopened banks were able to function only within a limited sphere.

It was impossible to get any adequate picture of living conditions in France. Food rationing began in August and became steadily more stringent in succeeding months. Gasoline nearly disappeared and private cars were banned Aug. 2. As early as November coal was being rationed by the pound in Paris. If France was not actually starving, some areas were certainly suffering from undernourishment and lack of heat.

Within the government the trend was steadily toward more control over local government, accompanied by a purge of all liberal elements. The cabinet was reshuffled Sept. 6, giving only 8 of the 12 members ministerial rank and leaving Laval the only member with parliamentary experience. Next to Pétain, Laval was the most powerful man in the government. On July 12 Pétain designated him as his successor. It was Laval who conducted the negotiations with the German government, working chiefly for a return of the government to Paris, the breaking down of the stringent barrier between occupied and unoccupied France, and the freeing of the French prisoners of war. On none of these points did he have much success.

Next to reaching a *modus vivendi* with Germany, the chief problem of French foreign policy was to retain the French colonial empire. Large concessions to Japan in Indo-China were made perforce, and at the end of the year a border war was being carried on there with Thailand. Of greater consequence was the de Gaullist movement. To check this movement Pétain on Sept. 7 sent General Weygand to take control of the African colonies and organize their defence. (*See* FRENCH COLONIAL EMPIRE.)

In the negotiations with the German government Laval consistently favoured close collaboration, but Pétain began to exhibit an increasing resistance to any large-scale concessions. After conversations with General Franco, Oct. 23, Hitler met Pétain the following day. Just what he demanded is not known, but possibly he asked for the right to send troops across France and the right to establish air bases in French colonies. At any rate it appears that Pétain offered little except further economic collaboration, though Laval continued the negotiations.

That collaboration was not working smoothly was evident when Pétain on Nov. 14 publicly protested the wholesale evacuation of the French from Lorraine. This action was only a continuation of a thorough policy of nazification which had been going on in Alsace and Lorraine since early August. By Dec. 3, Pétain announced that some 70,000 of these refugees were being ca for by the French government.

During November there were recurrent rumours of opposit to Laval developing in the Pétain cabinet. Likewise Gene Weygand, commander of the army in Africa, although firm loyal to Pétain, was reported to be opposed to Laval. This peared definitely to be the sentiment of a large part of the Fre people. To all outward appearances, however, Laval's posit remained unshaken, and the news of what the German pap called "the putsch of Vichy" came as a surprise to everyone.

The press carried the story Dec. 14 that at a cabinet meet the evening before Laval had been stripped of all his offices placed in "protective custody." Various explanations for his were advanced. Some held the theory that he planned a *co d'état* for Dec. 15, the occasion of the removal to Paris of ashes of Napoleon's son, the Duke of Reichstadt, and t rumours of this plot led to a showdown in the cabinet. Altho Flandin, considered favourable to collaboration with Germa was appointed foreign minister to replace Laval, the Germa government regarded the dismissal as a direct affront. Lav freedom was demanded and secured, but at the end of 1940 had not been reinstated; nor had any general agreement b reached by the two governments.

Certain factors may explain the stronger stand taken by Pét toward the end of the year. His personal popularity was great that the nazis, had they ousted him, would have found difficult to replace him with anyone enjoying to a like deg the respect of the French people.

Moreover, there was always the possibility that under press Pétain might take the fleet to North Africa and with Weygand army reopen the war. The growing strength of British po made this possibility seem less unlikely than it had appeared June. These are only speculations. Whatever the future ha offer, the year that closed on a note of such uncertainty been one of suffering and tragedy unparalleled in French tory. (D. C. McK.

Franco, Francisco (1892–), Spanish soldier and h of the Spanish government, was b in Galicia. After military service in Morocco, he became a col in 1926, and served under the Spanish republic of 1931 in Balearic islands, being later transferred to Morocco again. 1935, he was made chief of staff. On the outbreak of the war in June 1936, he flew to Tetuan, in Spanish Morocco, there organized the transport of Foreign Legionaries and Moo troops to the Spanish mainland, whither he soon followed. U the death of Gen. Sanjurjo, Gen. Franco became military lea of the insurgents. After his victorious conclusion of the civil in 1939 he added the title of prime minister to the others possessed, organized his cabinet, and began the task of re struction.

Franco issued a declaration of "strictest neutrality" at outset of the European war in Sept. 1939, but the possibility Spain's entry into the conflict after the French defeat was cause for much speculation during the last half of 1940. His ference with Hitler on the French-Spanish border Oct. 23 and visits of Serrano Suñer to Berlin and Rome seemed to indi that he was about to give the axis full military aid. Later, h ever, he reached an understanding with the British, who on 2 released frozen Spanish credits amounting to several hun thousand pounds. There were reports also at this time that H don had secretly promised Franco to return Gibraltar after war, in return for his non-belligerency.

According to dispatches from Washington on Dec. 7, Fra had assured the United States of his intentions to remain ne

d had requested a credit of $100,000,000 for food.

rank, Glenn (1887–1940), U.S. educator and publicist, was born in Queen City, Mo., Oct. 1, was gradu-ed from Northwestern university in 1912 and served as assistant the president of the university from 1912 to 1916. For the xt three years he was engaged in business research. In 1919 became a member of the editorial staff of *Century Magazine*, of hich he was made editor-in-chief in 1921. He held this post until 25, when he was elected president of the University of Wiscon-n, where he had a stormy career which ended in 1937 with his moval by the regents despite widespread protests. In December that year he was chosen chairman of a committee of specialists draft a program for the Republican National committee. He ught the Republican nomination for United States senator from isconsin in 1940, but was killed in an automobile accident ar Greenleaf, Wis., on Sept. 15, two days before the primary ection.

ee France: *see* EUROPEAN WAR; FRENCH COLONIAL EM-RE.

eemasonry: *see* MASONIC ORDER.

eer Gallery of Art: *see* SMITHSONIAN INSTITUTION.

ench Colonial Empire. Total area (approx.) 4,657,-000 sq.mi.; total pop. (est. c. 31, 1937) 70,147,000. Certain essential statistics of the ench colonies, protectorates and mandates are given in the ble on page 308.

History.—The outstanding event of the year 1940 was the ning of the armistice between France and Germany on June 22 d between France and Italy on June 24. The effects of this on the French colonial empire were: (1) the demilitarization of e important ports of Algeria, Tunis, Morocco, French Somali-nd and Syria; (2) the assumption by the armistice commission Wiesbaden of general control of colonial policy, particularly in e far east, where it acquiesced in the Japanese invasion of ench Indo-China; and (3) the creation of a schism between e colonies which accepted the armistice signed by the Pétain vernment and those which declared themselves ready to resist d proclaimed their wish to identify themselves with the cause Free France represented by General de Gaulle.

In the closing months of 1940, the French colonies adhering to ee France, with the dates of their adherence, were: New Hebri-s, July 20; Tahiti, Sept. 2; New Caledonia, Sept. 20; the Chad rritory, Aug. 26; the mandated territory of the Cameroons, g. 28; French Equatorial Africa, Aug. 28; French establish-nts in India, Sept. 9.

The remaining territories of the French colonial empire had icially acknowledged their allegiance to the French state, repre-nted by the government of Marshal Pétain.

Effective adherence to Free France was expressed either spon-neously or, in the case of colonies which possessed a representa-e council, either by a vote of that body or by a plebiscite. ebiscites were held in the New Hebrides, Tahiti and New Cale-nia. The entire population of Port Vila in the New Hebrides, out 400 men and women, met under the presidency of the vicar ostolic, Monseigneur Halbert. The assembly signified its vote either rising to its feet or remaining seated. Only four per-ns remained seated. The same method was adopted in Santo, e other principal town of the New Hebrides. In the islands of hiti, Morea and Paumotu 3,564 votes were given in favour of neral de Gaulle against 18 for the Vichy government. The vernor was deposed and the administration of the island taken er by a provisional committee composed of three members of

MAJ. GEN. NISHIHARA of Japan conducting negotiations with French officials for concessions in French Indo-China. Despite a signed agreement the Japanese invaded the colony Sept. 22, 1940

the privy council, subsequently confirmed in office by General de Gaulle who also appointed a governor in accordance with the wishes of the inhabitants and of the commissioner of the Pacific. In New Caledonia the general council voted an address to General de Gaulle on June 24; and the celebration of July 14 was the occasion for public demonstrations in the same spirit.

The French establishments in India decided to continue the struggle by the side of the Allies, on the basis of the treaty of 1814. On being informed by the governor, M. Bonvin, of his adherence to General de Gaulle, the viceroy of India at Simla confirmed him in his office. In the Chad Territory the governor, M. Eboué, and the military commandant, Colonel Marchand, published at Ft. Lamy on Aug. 26 a proclamation of loyalty to Free France.

Two days later the example of Chad was followed by the remainder of French Equatorial Africa and by the mandated territory of the Cameroons.

(*See* also EUROPEAN WAR.)

Economic Collaboration.—The conditions laid down for economic collaboration were as follows: Free France had clearly signified its decision to maintain the standing of the franc which, according to an agreement entered into with the British treasury, was to be linked up with sterling at a fixed parity exchange of $176\frac{7}{8}$ to the pound. Apart from the general agreement of Aug. 7, the basic document of collaboration between Great Britain and Free France, in respect of the colonies, was the letter written on Aug. 27 to General de Gaulle by the British prime minister, and published in the press, to the effect that the British government would do everything in its power to maintain the economic stability of all French overseas territories, provided they stood by the alliance; that it was ready to foster trade and help the administration of those parts of the French empire cut off from France, so long as the British way to victory was not impeded; and that to those colonies adhering to General de Gaulle it would extend economic assistance on a scale similar to that which would apply in comparable circumstances to British colonies.

The first proof of economic rehabilitation, apart from particular economic agreements, was in fact the raising of the blockade and the consequent enabling of the colonies to export and import, especially to and from Great Britain, the dominions and the

French Colonial Empire

Country and Area sq. miles (approx.)	Population (est. Dec. 31, 1937) (000's omitted)	Capital, Status, Governors, Premiers, etc.
ASIA		
French Indo-China, 283,000	23,300	Saigon, *Governor-General:* Admiral Decoux.
Annam, 55,800	5,656*	Hué, protectorate, *Resident-Superior:* M. Graffeuil.
Cambodia, 69,200	3,046*	Pnom Penh, protectorate, *Resident-Superior:* M. Thibaudeau.
Cochin-China, 25,400	4,616*	Saigon, colony, *Governor:* M. Veber.
Laos, 88,800	1,012*	Vientiane, protectorate, *Resident-Superior:* M. Touzet.
Tongking 43,800	8,700*	Hanoi, protectorate, *Resident-Superior:* M. Châtel.
Kwangchow Wan, 310	250	Fort Bayard, territory (leased from China), *Administrator:* M. Le Prévot.
French India, 190	300	Pondicherry, colony, *Governor:* M. Bonvin.
Syria and Lebanon, 77,700	3,600	Damascus, mandated territory, *High Commissioner:* General Dentz.
AFRICA		
Algeria, 845,400	7,400	Algiers, colony, under jurisdiction of the Minister of the Interior, *Governor-General:* Admiral Abrial.
Morocco (F.), 165,800	6,430	Rabat, protectorate, under the Minister of Foreign Affairs, *Sultan:* Sidi Mohammed. *Resident-General:* General Noguès.
Tunisia, 48,800	2,670	Tunis, protectorate, under the Minister of Foreign Affairs, *Bey:* Sidi Ahmed. *Resident-General:* Admiral Esteva.
French Somaliland, 8,380	50	Jibuti, colony, *Governor:* M. Deschamps.
Madagascar and Dependencies, 236,900	3,800	Antananarivo, colony, *Governor-General:* M. Annet.
Réunion, 920	210	St. Denis, colony, *Governor:* M. Aubert.
French Equatorial Africa, 867,700	3,500	Brazzaville, *Governor-General:* M. Eboué.
Gabon, 106,500	410*	Libreville, colony, *Governor:* Commandant Parent.
Middle Congo, 159,700	747*	Brazzaville, colony, *Administrator:* M. Bahot-Launoy.
Oubangui-Chari, 214,600	834*	Bangui, colony, *Governor:* M. de Saint-Mart.
Chad, 386,900	1,432*	Fort Lamy, colony, *Governor:* M. Lapie.
French West Africa, 1,807,700	14,750	Dakar, *Governor-General:* M. Boisson
Senegal, 77,000	1,700*	St. Louis, colony, *Governor:* M. Parizot.
Mauritania, 330,000	383*	St. Louis, colony, *Governor:* M. Beyrìès.
French Guinea, 97,000	2,011*	Conakry, colony, *Governor:* M. Giacobbi.
Ivory Coast, 183,000	3,851*	Abidjan, colony, *Governor:* M. Crocicchia.
Dahomey, 43,000	1,352*	Porto Novo, colony, *Governor:* M. Annette.
French Sudan, 577,000	3,569*	Koulouba (Bamako), colony, *Governor:* M. Desanti.
Niger, 500,000	1,747*	Niamey, colony, *Governor:* M. Rapenne.
Cameroons, 161,200	2,400	Yaoundé, mandated territory, *Governor:* M. Cournarie.
Togoland, 20,000	781	Lomé, mandated territory, *Administrator-Superior:* M. Montagné.
AMERICA		
French Guiana, including Inini, 34,740	37	Cayenne, colony, *Governor:* M. Chot-Plassot.
Guadeloupe, 690	310	Basse-Terre, colony, *Governor:* M. Pierre-Alype.
Martinique, 386	255	Fort-de-France, colony, *Governor:* M. Bressolles.
St. Pierre and Miquelon, 93	4	St. Pierre, colony, *Administrator:* M. de Bournat.
OCEANIA		
New Caledonia and Dependencies, 7,310	55	Noumea, colony, *Governor:* M. Sautot.
New Hebrides, 4,620	60	Vila, condominium, *Resident-Commissioner:* M. Kuter.
Pacific Islands, including Society Is., Tuamotu Is., Tubuai Archipelagos, etc. 1,540	45	Papeete, colony, *Governor:* M. De Curton.

*Population 1936 census.

United States of America.

Colonies Not Adhering to Free France.—The French colonies which had not adhered to Free France were all, in general, subject to the blockade and their internal economic situation was in consequence most precarious. Sporadic upheavals, more or less public, had made themselves evident in a great number of them. In the French West Indies, a special agreement was made in Aug. 1940 between the local authorities and the government of the United States, owing to the presence in the islands of several units of the French fleet. By this agreement, on the one hand the French warships were immobilized in their then harbours, and on the other hand the islands were allowed to continue their commercial relations. In French Indo-China an agreement signed with Japan on Sept. 22 put an end to long negotiations and gave the Japanese the right to occupy naval bases and to the passage of their troops. The latter concession, however, was not effect without resistance on the part of the French troops, who ga combat under conditions of which the details were not publish and lost several hundred men near Lang-Son, 60 mi. N. of Han (P. O. L.)

French Colonies in America.—In 1940 many conflicting mours concerning conditions emanated from Martinique a other islands. Defences of the island were reported strengthen On the other hand, in September, a plebiscite on the question continued support of the Vichy government was rumoured in t offing. U.S.-made aeroplanes on the aircraft carrier "Bearn," a cording to some accounts, had been exposed to the elements a were no longer in condition, but this was vigorously deni During November, several United States naval units cruised the vicinity of the island and, in early December, Pres. Roosevel on a tour of inspection of Caribbean defences, stopped outsi the territorial waters and conferred with the U.S. consul a the naval observer. At Washington, some days later, the Fren ambassador refused to comment on reports that the U.S.A. w negotiating with a view to acquire naval base rights. Effe of the French collapse were likewise felt in other coloni Guadeloupe, whose exports formerly went almost exclusively France, was estimated to have suffered a loss of 99% of its e ternal trade. St. Pierre and Miquelon, already in the vortex economic depression for nearly a decade, were subjected to Canadian semi-blockade similar to Martinique's. In Fren Guiana the great problem was that of the convicts in the pe colony.

Communication.—Under normal conditions Guadeloupe, Fren Guiana and Martinique have good external communication by and by sea. Guadeloupe and Martinique have adequate highw systems. In French Guiana, however, except on the coast, whe there are 250 km. of highway and 12 km. of railway, and Inini, transport services are primitive, although there are go interior waterways.

Trade and Resources.—St. Pierre and Miquelon depend tirely on fishing. Total exports in 1939 were valued at 18,010, francs, imports at 28,375,000 francs.

Guadeloupe and Martinique are essentially agricultural. Ab 60,000 hectares, a third of the entire area of Guadeloupe, is un production. Guadeloupe produces principally sugar, bana coffee and cacao. In 1937, 58,881 tons of sugar and 45,733 tons bananas were exported. Sugar refining and rum production important. There are 18 sugar mills and 94 rum distilleries. 1938 imports were valued at $8,465,000; exports $11,851,0 Foodstuffs, textiles, beverages and lumber are the chief impo Sugar is the leading export of Martinique; rum is second. B anas are important, with some 1,500 hectares under cultivati Pineapples are grown for canning (43,000 cases produced 1937). In 1938 these four commodities accounted for 98·8% all exports. Exports of $8,858,000 went almost entirely to Fra (99·1%); imports were $6,756,000 in value (France, 65·9 United States, 17·3%; Belgium, 6·8%). In 1940 Martinique p duced 55,000 tons of sugar, Guadeloupe 61,000 tons. Estim for 1941 were 65,000 and 61,000 tons, respectively.

French Guiana is the least developed European colony America. Its principal products are gold, tulipwood and o cabinet woods, sugar, bananas, rice, corn and manioc. Two-th of the imports formerly were supplied by France, most of the mainder by French colonies and the United States. Over 95% exports went to France. In 1938 imports approximated 54,000, francs; exports 46,000,000 francs. The monetary unit is French franc. (L. W. Be.

French Congo: *see* French Colonial Empire.

ench Equatorial Africa: *see* French Colonial Empire.
ench Guiana: *see* French Colonial Empire.
ench Guinea: *see* French Colonial Empire.
ench Indo-China: *see* Chinese-Japanese War; European ar; France; French Colonial Empire; Japan; Siam.

ench Literature. French literature during 1940 was under the sign of Mars. It was a difficult ar which mirrored the psychic and politico-military preoccupans of the nation. It was a period of apocalyptic introspections d historic changes in which the purely creative forces had rdly an opportunity to emerge.

Most of the younger writers were mobilized and at the front. e older generation of novelists, critics and poets limited their oduction to matters concerning the national defence. Jean raudoux, the novelist and playwright, became minister of information at the outbreak of the war, and was active in that capacuntil shortly before the armistice. Paul Valéry, André Maus, Jules Romains, Louis Gillet, Georges Duhamel and others ok part in propaganda activity through radio and newspaper rk. Paul Morand was in London in an important diplomatic st. Publishing was reduced to a minimum, yet it went on in te of censorship and a growing dearth of paper stock.

The frontier-war of patrol manoeuvres along the Maginot line, ich marked the first chapter of the war, brought forth a num- of books of a semi-military or lyrically confessional type. The ock of the invasion threw all creative and critical efforts into er confusion, and the voice of literary France was practically enced. The complete disorganization of every branch of pubing activity increased the impression of stunned chaos after armistice. The national revolution, led by Marshal Pétain, ich followed the annulment of the Third Republic by the genl assembly of July 10, 1940, encouraged the beginnings of a ongly marked traditionalist literature, the basic impulse of ich was an emphasis on the peasant direction given earlier by soldier-poet, Charles Péguy.

n the early months of the war, the mystic revolution which had been ng on for several years was still in full swing. It had manifested itself in piritual revival associated with the names of Patrice de la Tour du Pin, re-Jean Jouve, Paul Claudel, Jean Le Louet, in poetry; with the names Georges Bernanos, François Mauriac, Jacques Maritain, Marcel de Coste, nislas Fumet, in prose. Patrice de la Tour du Pin, who was definitely the ler of the revolution in mystic poetry, was wounded in Oct. 1939 and n prisoner on the Sarre front. Jean Le Louet was in Warsaw during the e. The group gathered around *Esprit* by Emmanuel Mounier continued efforts to create a personalist movement in a Christian, communal traon. *Yggdrasyll* continued to accentuate a metaphysical aspect of poetry, eloped its anti-surréalist direction, and published poems written at the it.

he romantic renaissance was flourishing during the Maginot stalemate. neo-romantic movement calling itself College for Sacred Sociology, cted by Georges Bataille, Roger Caillois, Georges Duthuit, Michel is, was still active in maintaining the primacy of the dionysian myth in attempting to revive the ritualistic gesture and ecstasy, particularly ine with Nietzschean doctrines. *Acéphale* was their medium. Albert uin's *Le Romantisme et le Rêve* had become the *livre de chevet* of the nger groups. The surréalist revolt, under André Breton, continued its antic explorations, but it was going towards its decline, and the mobilion of almost all its members simply affirmed concretely the already ving dispersion of its forces. The *Cahiers du Sud* gathered all these tered energies, emphasizing the reconstruction of a romantic myth.

he legal suppression of the extremist communist movement reduced the ers of this tendency to literary impotence. Their leader, Louis Aragon, se newspaper *Ce Soir* was suspended by the government in Sept. 1939, ed the colours, and was said to have been among those decorated r the battle of Dunkirk. In the spring of 1940 he published *Les Voyurs de l'Impériale,* a novel set in the Paris of 1900. Jean Giono, author umerous peasant novels, did not abandon his anarchic pacifism when war broke out. He published *Refus d'Obéissance* and was incarcerated the military authorities.

he first literary documents of the war began to appear in the early ng of 1940. André Chamson, whose leftist novels had a success before hostilities, published *Quatre Mois, Carnet d'un Officier de Liaison,* a onal diary of experiences and reflections by a sensitive writer trying ecord the human, all-too-human side of the border conflict. Armand tjean, one of the most brilliant among the younger French authors, had nurtured himself on the new nationalism which developed after internationalism of the so-called postwar years, fought heroically on Sarre front where he was wounded. His *Journal de Guerre* is a docut of high humanity and patriotism. Louis Aragon, Paul Eluard, André de Richaud used their leisure from military routine to indite poems that had a simple style reminiscent of folklore moods. The principal creative effort was to be found in the little reviews which began to pullulate in the tense spring and which were published by the soldiers themselves at the front. The review *P.C. 1940* (*Poètes Casqués*), *Cahiers de Poésie publiés par des Poètes Soldats,* opened its first issue with a tribute to Alan Seeger, the American soldier-poet of the World War of 1914–18, and published texts by Alain Borne, Bernard Privat, Pierre Seghers, André Blanchard, Paul Gilson. There were other soldier-magazines: *Le Clairon de Strasbourg, Le Vitaliste, Casemate.*

Behind the lines a diminished literary activity went on. None of the better known writers launched any new books. Francis Carco's *Bohème d'Artistes,* Raymond Queneau's *Un Rude Hiver,* Maxence van der Meersch's *Pêcheurs d'Hommes,* Jean-Paul Benech's *Amour de la Chasse,* René Béhaine's *Le Jour de Gloire,* Jean Marteau's *La Mainmorte,* Olivier Séchan's *Le Bouquet d'Orties,* Louis Daniélou's *Belle Marine* were among the more interesting novels that saw the light of day during the period of waiting. Marcel Jouhandeau appeared with *Requiem et Lux,* and Jean Cocteau with *Les Monstres Sacrés.* Reviews like the *Mercure de France, La Nouvelle Revue Française, Revue des Deux Mondes* and similar established magazines kept the public informed about the literary activities and tried to balance their critical judgments against the censorship interdictions.

The armistice of June 24, 1940 put a temporary end to the publishing activities of the country. The tracing of an artificial frontier between the occupied and non-occupied zones created unsurmountable mechanical barriers. Many projected publications of books and reviews were automatically abandoned. Many books and issues of magazines ready for distribution could not be moved. The great publishing houses in Paris and in the provinces were disorganized, and even the question of sufficient textbooks for the schools became very serious. The flight of the refugee writers southward paralyzed every effort at reconstruction.

The *Revue des Deux Mondes* and *L'Illustration* remained the only publications that continued with effective results. The former moved to Clermont-Ferrand and became the official organ of the new nationalist regime. Marshal Pétain used it to disseminate his first basic addresses to the nation. His speech on the new national education appeared there on Aug. 15, 1940. Traditionalist writers of the old schools found a haven in the pages of the review, notably: Henry Bordeaux, André Chaumeix, Pierre Bernus, André Demaison, Victor Giraud, Henri Pourrat, Maurice Coste and Robert d'Harcourt.

Under the impulse of the nationalist revolution a reorientation began slowly to take place. The regime itself, having announced its reactionary policy under the slogan of "Fatherland, Work and Family," accentuated the importance of the peasant's position in the body politic. The notion of the "return to the earth," and a determined revolt against the big city, overshadowed all other preoccupations.

A new and significant development in French literature can be noted in the fact that French books were in 1940 being published on foreign soil. Exiled writers like André Maurois, Jules Romains, André Simone, Denis de Rougemont, Ivan Goll and others published their books in French in New York. A French publishing house was founded in Canada. Jules Romains presented his *Sept Mystères du Destin de l'Europe* in the collection *Voix de France* (New York) in which he recounted his experiences during his year-long efforts towards the maintenance of peace in Europe, and in which he analyzed the enigmatic forces that made that dream impossible. André Maurois, whose *Tragédie en France* also appeared in the collection *Voix de France,* gave a graphic reportage of his experiences as liaison officer during the invasion of France. Ivan Goll published a further instalment of his long-range poem *Jean Sans Terre.* (E. Js.)

French Pacific Islands: *see* Pacific Islands, French.
French Somaliland: *see* French Colonial Empire.
French Sudan: *see* French Colonial Empire.
French West Africa: *see* French Colonial Empire.
Frequency Modulation: *see* Advertising: *Radio;* Radio, Industrial Aspects of; Radio, Scientific Developments of; Telegraphy; Television.

Friedrich Karl (1868–1940), landgrave of Hesse, Germany, was born in Holstein, May 1, the son of Landgrave Friedrich Wilhelm. He served in the World War of 1914–18 as a lieutenant general of German infantry. In 1918 he was elected king of Finland but because of the objection of the Entente powers he refused the throne.

He succeeded to the title of landgrave on March 25, 1925, after it had been renounced by his elder brother. He married Margaret of Prussia, a sister of former Kaiser Wilhelm, on Jan. 25, 1893. He died in Cassel, Germany, May 29.

Friends, Religious Society of. The Religious Society of Friends had in 1940 a membership of approximately 160,000, which comprised 54 yearly meetings and annual conference groups. The society was in 1940 represented in 30 countries throughout the world. The membership of Friends in America was 110,000. In the United States

and Canada there were 27 yearly meetings in 1940. Six of these meetings composed the Friends General conference, which held its biennial meeting at Cape May, N. J., July 8–15, 1940. Ten of the yearly meetings belonged in an association which meets quinquennially and is known as the five-years' meeting. The last session was held at Richmond, Ind., on Oct. 16–23, 1940.

Since the Friends World conference held at Swarthmore and Haverford colleges, Pennsylvania, in 1937, Friends throughout the world have been co-operating through the Friends World Committee for Consultation, with headquarters in London and in Philadelphia. Friends centres are maintained in several cities of international importance by co-operation between the English and American service committees, and the Friends in the particular country. These centres are in Berlin, Vienna, Geneva, Copenhagen, Amsterdam, Paris, Rome, Tokyo and Shanghai. All of these centres operated continuously during 1940. Their function included assistance to refugees, local relief when needed, promoting fellowship among Friends and serving as a centre of international understanding and good will. As a development of their schools and missionary work, Friends also have local centres in Palestine and Syria, India, East Africa, Pemba, Madagascar, Cuba, Jamaica, Mexico and Alaska.

The American Friends service committee conducts the chief program of social action for the society in the United States. The main activities are directed by the social-industrial, peace, foreign service, and fellowship council sections of the committee.

The social-industrial section conducts work camps in areas of social conflict, where university students volunteer for nine weeks during the summer to work on creatively constructive projects for the community, such as building playgrounds, or swimming pools; or building better homes; or work in the national forests. Meanwhile they study the social problem of the community. In 1940, 258 young people participated in this exploration of good will as an alternative to the use of violence in dealing with social problems.

National volunteer service was organized during the fall of 1940 to meet the need of young men who wanted to give a year of volunteer service of national importance, equivalent to the year of military service prescribed by the government. The work camp at Cooperstown, N.Y., was extended to an all-year term to serve this purpose. In the autumn the service committee organized civilian public service to provide opportunity for pacifists to perform work of national importance under civilian direction, such as may be assigned to conscientious objectors under the National Selective Service act.

The peace section conducted during the summer ten institutes of international relations, and through the student peace service sponsored 117 young people who directed peace education in 21 rural communities. Eighteen young people went to Mexico during the summer and assisted Mexican peasants erect two schoolhouses. Attention is given to the problems faced by the conscientious objectors.

The foreign service section co-operated with English Friends through the Friends service council in maintaining the Quaker centres of service and good will mentioned above. Through the committee's refugee service three hostels have been established. One is at Havana, Cuba, one at the former Scattergood school at West Branch, Ia., and one at Richmond, Ind., known as Quaker Hill. In addition to these permanent hostels the refugee committee has directed summer hostels, seminars, and language camps for refugees. It has opened a teachers' work shop at Haverford, Pa.

Relief to the hungry victims of war was in 1940 the chief concern of the committee in its work abroad. Just before Europe broke into open war, feeding of 500,000 Spanish children daily was carried on by the committee workers in Spain. Since t time the chief need has shifted to the section of France unoc pied by the Germans. At the close of the year there were representatives of the committee in France with field office Toulouse, Montauban, Perpignan, Auch and Marseilles. In area more than 7,000,000 refugees from Belgium, Holland the northern departments of France in addition to Spanish r gees have sought refuge.

The fellowship council seeks to interpret the spiritual mess of the Society of Friends. It corresponds with members of wider Quaker fellowship who are attracted to the Society Friends by its peace testimony, its social action, its concern the sacredness of personality and the freedom of conscience.

Friends maintain private schools in England, Australia, N Zealand, Ireland, Holland, India, China, Japan, Africa, the Un States, Palestine and Madagascar. In 1940 there were 56 these schools, enrolling 38,200 pupils.

Four Friends bodies acted during the year on the invitatio join the World Council of Churches. The five-years' meeting Philadelphia yearly meeting held at Arch street accepted the i tation, with a reservation that the statement of basis be held to be a creed. Friends General conference accepted, provi the basis be extended to include other than creedal churc London yearly meeting found it impossible to accept the inv tion lest their objection to a creed be misunderstood.

(L. D. Sh

Frohman, Daniel (1851–1940), American theatrical m ager, was born in Sandusky, Ohio, Aug At one time or another he managed the Fifth Avenue theatre, Madison Square theatre, Daly's theatre and the Lyceum thea all in New York city. He made E. H. Sothern a star, and am others who appeared under his management were Mary Ander Fanny Davenport, Salvini, William Gillette, Robert Mantell Maude Adams. He died in New York city, Dec. 26.

Fruit: *see* Apples; Bananas; Grapefruit; Grapes; Lem and Limes; Oranges; Peaches; Pears; Pineapples; Pl and Prunes.

Fuel: *see* Coal Industry; Gasoline; Natural Gas; Pe leum.

Fuel Briquettes. The compression of finely divided or grade coal into briquettes, to make it m adaptable as a fuel, has grown to an industry of considerable m nitude in a number of countries, especially those having l supplies of low grade coals. Some of the leading outputs in were as follows: United States 936,400 metric tons; Bel 1,712,000 tons; Czechoslovakia 724,000 tons; France 7,475 tons; Germany 51,000,000 tons; Netherlands 1,323,000 t Total world production is estimated at 64,834,000 tons. In of the leading European producing countries briquettes have important place in export fuel trade; both France and Germ have net exports in excess of a million tons, while Belgium st at about half that figure; Czechoslovakia had a small export plus, but in Netherlands imports exceed exports. Imports the United States are negligibly small, and exports are only sli greater, chiefly to Canada. Although little of the United St output is exported, domestic consumption is widely distribu shipments having been made in 1939 to 38 States, Alaska, the District of Columbia. Included in the briquette outpu ported above, there was produced in 1939 in the United St 215,500 short tons of briquettes wrapped in paper for conveni and cleanliness in handling, the product being commercially kn as "packaged fuel."

(G. A. Ro

urniture Industry. The approximately 2,250 factories in the United States manufacturing ooden and metal furniture completed 1940 with a dollar volume ain of 15%, bringing total production to $465,000,000, or pproximately back to the 1937 level but still 28% behind the 929 volume of $659,000,000. The chief cause of this gain has een small home building, although army cantonment requirements also contributed something to this improvement.

The furniture industry is well distributed geographically, with s principal manufacturers centred in New York state, Illinois, orth Carolina, Indiana, Pennsylvania, Michigan, Virginia, Ohio, alifornia, Massachusetts, Wisconsin and Oregon.

Despite the steady growth in popularity of metal furniture nce 1930, wood remains the dominant raw material in about 5% of the output. Glass and synthetics are beginning to be ilized more generously, but such furniture is a negligible quanty, not exceeding 2%.

The principal woods used in 1940 as shown by a survey of the urniture Mart, Chicago, the world's largest exclusive home rnishings marketing centre, were in the following order: mahogny, walnut, maple, oak, oriental wood, Philippine woods, aspen, tinwood, miscellaneous woods and imitations.

The furniture industry spent one-third of its income for materials, as follows: lumber, $75,000,000; finishing materials, $15,000,000; steel, $25,000,000; fabrics, $25,000,000; other supplies, 0,000,000. Labour received about 30% or $125,000,000 as its are, while selling, administration and taxes ate up another third, aving manufacturers a slim net profit not to exceed 3% and many cases less.

In 1929 there were 3,500 furniture factories in the United ates. The mortality was heaviest from 1932 to 1934, one-third ving been liquidated. Since 1935 there has been a slow increase 250 factories, most of them small producers of upholstered rniture and casegoods.

Europe.—During 1940 the furniture industry in Europe was moralized by the war. France's 500 factories, mostly small, ased or turned to war orders. England's 1,500 small and large ctories lost most of their export trade and tried to aid national fence to survive. Germany's 1,000 furniture factories were aking only enough for home consumption and existing preriously with foreign supplies and trade cut off. Canada's 100 rniture factories, on the other hand, were having their greatest om in 20 years with volume up nearly 50%. (J. A. G.)

urs. The year 1940, compared with 1939, brought an increase in business of over 35% in dollar sales volume to the S. fur industry and around 45% in the number of garments ld. Skin prices were generally low during the first half of the ar. The turning point came following the successful withdrawal the British army from Dunkirk, France. The industry exrienced an active spring business, stimulated by the low retail ices and a vogue for jackets and scarfs.

The public began to buy coats freely in August. This movent gained during the late fall and reached a peak in Novemr. Retail distribution and wholesale manufacturers felt the nefit of increased consumer buying power, following wideread industrial activity during the last quarter of the year. ational defence and British armament expenditures brought eady work to the people in many towns and cities. More men than for many years past invested in fur apparel. The evailing retail price range on a variety of furs was from $100 to $300. An abundance of fur skins from Canada, U.S.S.R., ghanistan, China, Australia, Southwest Africa, India, South nerica and Europe added to the U.S. supply and kept skin ices at reasonable levels in spite of an increased consumer demand. Quantities of skins were evacuated from Europe and sent to New York before the Mediterranean seaports were blockaded. Much foreign fur capital fled from Europe to America. United States imports of all kinds of furs for the 12-months period Dec. 1939 to Nov. 1940 totalled over $75,626,000 compared with $52,402,925 for the corresponding period in 1938–39. Most of this was due to heavy imports of Persian lamb ($24,954,040) from Southwest Africa, U.S.S.R. and Afghanistan. These were formerly marketed in London, Leningrad, Leipzig and Paris.

United States exports totalled in value $11,732,598 for the 1939–40 12-months period compared with $11,957,346 in 1938–39. The number of skins shipped was 12,000,000 odd, the same number as in 1938–39. Some of these skins were shipped back to the United States from Europe when the Germans invaded France, and started bombing London.

The prospect of Canadian and Scandinavian silver fox breeders dumping their 1939 production of some 700,000 fox pelts in the United States, since the European markets were closed by the war, induced the U.S. government to establish a quota of 100,000 skins for 12 months on imports of silver fox from all foreign sources. This action saved the American fox breeders from ruin, which faced them in December of 1939. It stabilized silver fox prices, although the article hit a new low price level and only showed recovery during the last half of the year.

Canada shipped into the U.S. 58,300 silver fox skins and Norway over 35,000. The quota continued during 1941 with Canada's share increased to 70,000 skins.

There was an influx of new capital into the industry in 1940, which was accounted for by the opening of several thousand new firms, merchants, dealers, manufacturers and retail outlets. The industry was free from serious labour trouble. Workers enjoyed longer periods of employment than any year since 1928. Financing was facilitated by additional association and factoring resources. Credit was kept under efficient control, but was generally considered to be cheap. The U.S. fur industry consumed about twice as many foreign fur skins as it did domestic fur skins. There was an increase in the amount of fur dressing and dyeing of about 20% over 1939.

For the time, the New York fur market became the fur centre of the world and the only free fur market in existence. Others were either closed or under strict government control. For the first time the Norwegian platina fox was introduced to the U.S. trade in considerable quantities (1,000 skins). This so-called platinum fox is a new type and at a public auction in New York one skin brought $10,000 which was the highest price ever paid in the history of the fur trade for a single fur skin.

During 1940 there were 169 insolvencies in the U.S. fur trade, representing liabilities of $3,760,155. This was a slight increase over 1939. Of the insolvencies 104 were in New York city and 65 were outside of the metropolitan area. From a financial and industrial point of view the U.S. fur trade ended the year 1940 with a turnover of merchandise approximating that of 1929 and representing about $175,000,000 in wholesale value and approximately $300,000,000 in retail value. (W. J. Bt.)

Gambia: *see* British West Africa.

Gamelin, Maurice Gustave (1872–), French soldier. Son of a general, he was born in Paris and educated at St. Cyr. He was chief of staff of Gen. Joffre in 1914 and played an important part at the battle of the Marne; it was he who was reputedly most insistent in his prophecies that Germany would invade France by way of Belgium. He was promoted general of brigade and in 1917 became commander of a division. After the war he was head of a military mission to Brazil until 1925, when he was appointed commander of French forces in the Levant. He became chief of the general staff in 1931, inspector general in 1935 and supreme commander of all armed forces June 6, 1939. His tactics after the start of war in Sept. 1939 were built largely around defence, and consequently Germany's mechanized war of movement in May and June 1940 found France woefully unequipped to stem the invasion.

On May 19 he was replaced as commander in chief by Gen. Maxime Weygand (*q.v.*). Gamelin was placed in "administrative internment" Sept. 7 at the Château de Chazeron near Vichy, where he passed the time writing his memoirs. On Nov. 17 he was formally arrested and taken to a detention centre near Riom to await the war-guilt trial.

Gandhi, Mohandas Karamchand (1869–), Hindu nationalist leader, was born at Porbandar (Kathiawar), India. For his biography, see *Encyclopædia Britannica,* vol. 10, p. 15. At Madras on Jan. 22, 1937 Gandhi announced his retirement from active Indian politics, but by 1940 he was as prominent as ever in Indian affairs of state. The All-India congress on March 20 delegated to him the

direction of negotiations with Great Britain for national independence. On April 27 he disavowed any intention of embarrassing Britain during the war by conducting another campaign of civil disobedience. After the defeat of France he suggested nonviolence to combat Hitler and on July 2 he urged Britain to seek peace with Germany.

Gandhi reiterated his stand for complete independence on July 6 and was silent on Viceroy Lord Linlithgow's offer of Aug. 8 to grant India dominion status after the war. On Sept. 17 the All-India congress committee elected Gandhi its leader by a vote of 192 to 7; only the communist members opposed him.

Garland, (Hannibal) Hamlin (1860–1940), U.S. author, was born in West Salem, Wis., Sept. 14, and died in Hollywood, Calif., March 4. For a biographical sketch see *Encyclopædia Britannica,* vol. 10, p. 27.

Gas, Natural: *see* NATURAL GAS.
Gas-Electric Bus: *see* ELECTRIC TRANSPORTATION: *Self-contained Units.*
Gas Masks: *see* CHEMICAL WARFARE.

Gasoline. Estimates of the amount of gasoline necessary for one day's operation of bombing and pursuit planes alone in military operations in Europe, total the incredible figure of more than 2,225,000 gal.—sufficient to operate 3,000 American passenger cars for one year. The gasoline consumption of the German army in the few weeks of its drive through the low countries and into France is estimated to have been greater than its consumption during the entire four years of the war of 1914–18. The relative positions of Germany and Britain as to oil supplies found Britain in 1940 the stronger (*see* PETROLEUM), despite the building up by Germany of a huge synthetic gasoline industry from coal and lignite.

Civilian consumption of gasoline in belligerent countries in 1940 practically ceased and the same was true in non-belligerent, occupied countries or countries within blockade zones. Horse-drawn vehicles and bicycles came back. The principal business of some of the automobile companies in France and Belgium was the manufacture of small trailers carrying equipment to generate gas from charcoal.

The ban on civilian consumption of gasoline tended to defer the day of shortage for the belligerents. Germany had hoarded gasoline for years. She seized great stocks in Belgium, Holland and France. Up to Jan. 1, 1941, neither the axis powers, nor Britain, suffered any actual shortage of gasoline supply.

Because of the collapse of France and the blockade of continental Europe and part of Africa, gasoline exports from the United States for the first nine months of 1940 dropped 48% from the corresponding period in 1939.

Consumption of oil in the United Kingdom in the 12 months to Sept. 1940 was estimated to have been at 35% to 40% less than in the preceding 12 months. In Italy, where rationing of gasoline started on Sept. 1, 1939, it was estimated that consumption declined 60% to 70%. No figures were, in 1940, available for Germany, but it was known that the civilian consumption of oil there was restricted severely.

As to quality of the product available to the belligerent powers, Britain demonstrated a distinct advantage over the axis. Her resistance to what seemed overwhelming odds in the number of planes was made possible, to no small extent, by the superiority in the quality of her aviation gasoline. Germany had little better than 87-octane gasoline, usually containing excessive quantities of lead, whereas Britain had the benefit of her own and American aviation gasoline of 100-octane number or slightly better.

Although the advantage of high-octane gasoline in making p sible higher compression engines has long been understood, it mained for Britain to demonstrate its tremendous value to av tion in war. In aviation, the more efficient high compress engines have three advantages—first, a smaller fuel load; seco a lighter engine per horsepower and third, less head resistan due both to a smaller engine and a lower cooling load, beca more heat is converted into work and less rejected to the atm phere. These advantages mean higher speed and greater lo carrying ability of planes. The difference in British and Gern aviation fuel, might easily mean a difference of 25 m.p.h. in top speeds of two fighting planes, giving the control of the tack or retreat to the faster plane.

Britain had available in 1940 through U.S. purchases la supplies of this vital high-octane aviation gasoline. While dinary motor gasoline was making its steady climb from 50-octa during the war of 1914–18 to around 75-octane at the outbreak the war in 1939, U.S. refinery technicians with army and na representatives sought to reach the goal of 100-octane for milit aviation. In 1930, such a fuel was available only in laborat quantities at a price of $10 per gallon. As a result of resea and the development of several synthetic methods, 100-octa gasoline was available in 1940 in large quantities at around cents a gallon. The raw materials for these synthetic proces are certain constituents of natural and refinery gas, availa in suitable quantities in almost any large refinery. The fi product usually contains some fairly high octane straight- gasoline and other constituents including not more than 3 of tetraethyl lead.

The U.S. petroleum industry installed synthetic capacity yond the domestic and foreign demands. The development super-gasoline had an important bearing on the United Sta national defence program which called for plane manufacture exceed that of any other country. Robert E. Wilson, oil advi to the Advisory commission of the National Defence coun stated in 1940 that the installed capacity is, however, bar enough to meet probable peacetime requirements, including ports, once the advanced aviation training program is underw and is substantially less than enough to meet estimates of wartime demand after the United States plane-building progr is complete. He advocated the building up of stocks of this f and that no more synthetic product be diverted to motor fuel

Additional synthetic capacity could also make it possible improve further the octane rating of gasoline used by the m tary service, he said, or it could be used to increase the qu tity of 91-octane available for training purposes. Gasoline 91-octane number is to be the main reliance for more than h of the training activities of the service, and will also be wid used by the air lines and as a constituent of 100-octane gasoli The petroleum industry in 1940 was working closely with defence commission to guard against any bottlenecks in supp ing high-octane gasoline for defence requirements.

The petroleum industry was, in 1940, probably the b equipped industry in the United States to do the job requi under the national defence program. This is largely due to t factors: first, the industry has utilized every opportunity scientific advance with large home resources available, a second, it has expanded production and hence use of petrole products to an extent not even closely approximated in any ot country.

Oil-producing states which practised proration and conservat principles have built up tremendous underground reserves crude oil, available at a moment's notice for practically a emergency. The industry pursues a normal activity toward m ing new discoveries.

Civilian demand in the United States is so large that it dwarfs very possible military demand except for a few special products. 'here was in 1940 one motor car to every four persons in the Jnited States, and the family life and residence revolved largely round the automobile. In cities like Chicago and St. Louis rom 40% to 55% of the people entering the central zone of the ity do so by means of gasoline. Therefore, curtailment of civilian se of gasoline in the United States while capable of releasing uge supplies for military purposes is not as easily accomplished vithout acute dislocation. Large systems of motor transportaion have been built up. In 1940 the possibility of rationing asoline to the public seemed remote.

Defence plans, which included the provision of adequate necesary petroleum products to Britain, embraced the expansion of efinery plant and processing for high-octane aviation gasoline. o far as transportation of crude oil to refineries is concerned, here was in 1940 adequate capacity in existing pipe lines to ake care of reasonable expansion, but it will be necessary to ontinue to build new lines into new oil fields and to supplement ines into fields where the production is increased.

Gasoline transportation by tank car and pipe line in the interior f the country was, in 1940, also said to be capable of handling substantially increased load without difficulty.

The most serious possible bottleneck is in tanker transportation acilities, which in 1940 were not adequate to take care of any harp increase in demand. However, a considerable number of ankers was under construction in 1940. In an emergency, it is tated that arrangements could be made to put a number of forign tankers into U.S. service.

Also included in U.S. defence plans was the provision of larger torage for some petroleum products, principally of aviation gasoine and fuel oil. At the request of the defence commission, the American Petroleum institute appointed a number of regional ommittees to study the question of adequate protection from ossible bombing attack of such storage facilities as well as xisting industry storage tanks and terminals. (*See* also PETROLEUM.)

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Gatti-Casazza, Giulio (1869–1940), Italian opera director, was born in Udine, Feb. 3, and died n Ferrara, Sept. 2. For a biographical sketch see *Encyclopædia Britannica,* vol. 10, p. 71.

Gaulle, Charles de (1890–), French soldier and leader of the forces of "free France" after the armistices of June 22–24, 1940, graduated from St. Cyr military college at Paris shortly before the German invasion of France in 1914. Wounded three times during the war, he was captured by German troops at Verdun in 1916, but escaped and saw further action on the western front and in the near east. Foreseeing the future tactical importance of tanks and combat cars, he waged a one-man campaign to persuade France to mechanize her infantry after 1918, but army officers preferred to place their trust in such measures of immobile defence as the Maginot line. The first several days of Germany's lightning thrust through Belgium and the Netherlands in May 1940 proved the correctness of de Gaulle's theories and he was belatedly made undersecretary of war in Reynaud's cabinet. He parted ways with Marshal Pétain's government when it elected to surrender and he fled to London. Here on June 23 he announced formation of the French National committee, an expatriate military and political organization which by the end of November claimed 35,000 troops and 20 warships. Much of French Equatorial Africa, French Oceania, French India and Caledonia rallied to de Gaulle's banner despite the fact that the Vichy government had condemned him to death *in absentia* for treason on Aug. 2. After an abortive attempt to capture Dakar, Senegal, with the support of British warships Sept. 23–25, 1940, de Gaulle landed troops at Libreville Nov. 9 and within three days had secured all of Gabun. A month later his troops were reported active in the British counteroffensive against Italy in North Africa.

General Federation of Women's Clubs: *see* WOMEN'S CLUBS, GENERAL FEDERATION OF.

Genetics. In 1940 genetic studies on over 80 organisms were published. Of these man, Drosophila, poultry and mouse received the most attention among animals, and corn, wheat and Tradescantia among plants.

Human Genetics.—Through the study of a large family pedigree in which colour-blindness and night-blindness appear, White and Haldane demonstrated the linkage of these two factors. They established a cross-over value of 43%. This important step in human genetic analysis indicated that the X-chromosome map of man is long. By analyzing all data on tumours in twins, including 15 new cases, Macklin concluded that incidence and specificity of tumours in identical twins are higher than in fraternal twins. Of particular interest to the lay reader is a new book by Newman on *Multiple Human Births.* The Dionne quintuplets furnish critical material for the nature-nurture problem.

Animal Genetics.—Hutt and Lamoreux published a summary of linkage in the fowl, with 23 genes assigned to six linkage groups. Photographs of these and their wild-type alleles are included. After summarizing all pertinent linkage data Punnett concluded that the X-chromosome in the fowl is very long. Gruneberg described the anaemias produced by two dominant spotting alleles in mice. Chen discovered a number of polyploid races of Paramecium bursaria. He found that races with different chromosome numbers may conjugate, resulting in ex-conjugants with equal chromosome numbers. Thus conjugation counteracts chromosome variability. White reported a population of grasshoppers in which a reciprocal translocation has occurred between two chromosomes. An extensive monograph on genetic studies in Drosophila was published by J. T. Patterson and colleagues. They analyzed the phenotypic effects of many chromosome irregularities, and succeeded in making several new sub-species crosses. On cytological and morphological grounds Sturtevant proposed a tentative phylogeny of the sub-genera and species-groups of Drosophila. Muller reviewed work on structural changes in Drosophila chromosomes, particularly following X-ray treatment. White brought together all the data on multiple sex chromosomes.

Plant Genetics.—Darlington and his co-workers published a series of papers dealing with the mechanics of meiotic cell division through studies on diverse groups of plants, utilizing species hybrids for resolving many of the problems. Sax made a careful analysis of chromosome aberrations in Tradescantia following X-ray treatment. He found that for one-hit breaks in the chromatin the number is directly proportional to the time-intensity factor, but for two-hit breaks resulting in aberrations high intensity is more effective. This is owing to the limited time which can elapse between the two breaks if reciprocal fusions are to occur. Riley studied the hybridization in a natural population of three Tradescantia species. He found evidence from both cytology and morphology that extensive exchange of chromatin is going on between species. Crane was able to establish the hybrid origin of the hexaploid loganberry by re-synthesizing it through crossing an octoploid and a tetraploid raspberry.

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Geographical Society, American: *see* AMERICAN GEOGRAPHICAL SOCIETY.

Geology. Wars seriously reduced geologic research and publication. The work of many scientists in this field was diverted into technological channels incident to the conflicts.

In the United States the geological survey did an exceedingly large amount of investigative work on sources of supply of strategic minerals in connection with the rearmament program. Interest in conservation of soils, water and mineral resources continued in 1940, as indicated by the publication of considerable material on this subject.

Geomorphology.—*The Origin of Submarine Canyons, A Critical Review of Hypotheses* by Douglas Johnson condenses the latest views on this subject. Late in 1939 there appeared another work in the same field, namely: *Atlantic Submarine Valleys of the United States and the Congo Submarine Valley* by Veatch and Smith. This latter paper is accompanied by several supplementary charts based on the more recent hydrographic soundings on continental shelves. The appearance of Atwood's *Physiographic Provinces of North America* is the latest authentic treatment of the continent from the regional viewpoint.

Historical Geology.—In this field a very important theoretical work to appear was *The Rhythm of the Ages* (*Earth History in the Light of the Pulsation and Polar Control Theories*) by Grabau. This study presents several applications and a general expansion of the author's original hypotheses derived from his unusually widespread stratigraphic investigations.

Sedimentation.—The trend in this field is towards greater attention to the ancient deposits. In the past few years emphasis was placed on recent sediments, and the data derived from such studies may now be utilized in the interpretation of the structures and other features of older sedimentary rocks.

Structural Geology.—*Strength and Structure of the Earth* by Daly treats of isostasy, gravimetric anomalies and their relationship to the constitution of the earth's interior and broad scale orogenic processes. The fifth edition of *Structural and Field Geology* by Geikie, revised by Campbell and Craig, affords a modernization of this standard source book for engineers and geology students.

Regional Geology.—Vol. 1 of the reports on the *Geological Expedition to the Lesser Sunda Islands* by the Amsterdam university, under the leadership of Brouwer, appeared. This represents a preliminary report on the areal geology and palaeontology of Timor and near-by islands of the Netherlands East Indies, which region is of interest particularly in terms of details of structure found in mountain arcs. Other important contributions to the knowledge of relatively little known portions of the earth were as follows: *Geology of China* by Lee; United States geological survey professional paper *Areal Geology of Alaska;* and *Grönland,* a symposium containing some 20 papers on various phases of the geology of Greenland.

Petrology and Petrography.—Publication of the revision of Short's *Microscopic Determination of the Ore Minerals* was a stimulus to mineralography. New features are the more critical determinative tables, a complete section on ore polishing, and a discussion of the new slit photomicrometer technique utilizing reflectivity as a diagnostic property. Researches in experimental geology included work on the thermal conductivity of rocks such as may eventually serve as a guide to crustal composition and afford useful data on cooling of intrusives and possibly on differentiation of ore deposits of magmatic affinities.

Die Entstehung der Gesteine by Barth, Correns and Eskola is a comprehensive treatment of petrogenesis from the physicochemical, quantitative standpoint. It represents a unique and very useful condensation and interpretation of the knowledge to date (1940) as regards the origin of principal rock types. A detailed monograph on significant petrographic and structural aspects of the Adirondack region was presented by Arthur F. Buddington as *The Adirondack Igneous Rocks and Their Metamorphism.* In this treatise the controversial anorthosite masses of that region are interpreted as direct magmatic products. Progressive metamorphism of calcareous sediments was studied synthetically by Bowen who was able to establish a thermal indicator series of minerals most useful in interpretation of contact metamorphic deposits.

Economic Geology.—A significant but controversial contribution on the subject of ore deposition was made by Graton in his article on *The Nature of the Ore-Forming Fluid.* The principles advanced by Bandy in his paper *A Theory of Mineral Sequence in Hypogene Ore Deposits* point toward new advances. The usual studies of mineral deposits indicate a trend towards more consideration of influences of specific structural controls responsible for ore localization. A revised edition of *Coal* by Moore presents a comprehensive work on the geology and distribution of the coal resources of the world. In the field of petroleum geology, geochemical explorations based on analyses of soils are receiving much attention as a possible new method of discovery. The American Association of Petroleum Geologists sponsored an intensive study of the Permian of the western United States. The research committee of this organization also sponsored in 1940, through sub-committees, research on the subjects of sedimentation and reservoir rocks, oil field waters, origin and evolution of oil, and the migration and accumulation of oil. Interest in the conservation of mineral resources and soils is indicated by the appearance of *Conservation in the United States* by Gustafson, Ries, Guise and Hamilton and a revised edition of *Natural Resources and Their Conservation* edited by Perkins and Whitaker.

Source Books.—A *Dictionary of Geological Terms* by Rice, which is essentially a compilation of definitions of terms applicable to major geological fields, was published. (*See* also MINERALOGY; PALAEONTOLOGY; SEISMOLOGY.) (F. M. V. T.; J. C. HF.; B. H. P.)

George VI (1895–), king of Great Britain and Ireland (see *Encyclopædia Britannica,* vol. 10, p. 191) continued, by his example and by his indefatigable attention to its social as well as military and political welfare, to lead his empire during its second year of war. With his own London residence, Buckingham palace, three times bombed from the air (*see* LONDON), he shared to the full with his people at home all the honours and discomforts of being in "the front line"; and the sympathy shown by him and Queen Elizabeth on their many visits to bombed areas and ruined homes was very highly valued.

The king's public activities were almost entirely connected with the war; the chief exception being his opening of Church House, Westminster, the new home of the national assembly of the Church of England. His first war investiture was held on February 6, and others followed in April—when relatives of recipients of honours were for the first time admitted as spectators—and later in the year. Among his foreign contacts were his reception of the queen of the Netherlands (May 13) and the king of Norway (June 10) on their taking up residence, and of President Roosevelt's envoy, Sumner Welles (March 11) and M. Raczkiewicz, president of the Polish republic (June 21). Of his public utterances the most important were his inspiriting broadcasts to his

KING GEORGE and Queen Elizabeth examining the damage to Buckingham palace caused Sept. 10, 1940, by a German time bomb

mpire on Empire Day (May 24) and on Sept. 23. In the former, which was clearly heard in the United States, he drew attention o the disparity between the German and British implications of he term "imperialism," which to the German connotes "the spirit of domination and the lust of conquest" and to the empire that peace in which our institutions may be developed, the condition of our peoples improved, and the problems of government solved n a spirit of good will"; in the course of the latter—again delivred from Buckingham palace—he announced the creation of a new mark of honour for men and women for civilian gallantry, onsisting of the George cross, to rank next after the Victoria ross, and the George medal for wider distribution. Following he Empire Day broadcast came the day of national prayer May 26), when the king and queen, with the queen of the Netherlands, attended divine service in Westminster Abbey.

It was with great regret that the king had to cancel his boys' amp, so long an annual fixture; but a large part of his year vas spent in visiting, often accompanied by the queen, troops, nunition factories, dockyards and, later, bombed areas in all parts of the country. Canadians, Australians, New Zealanders, he Home Guard, the Auxiliary Territorial service, Auxiliary Fire service and all branches of the civil defence services were eviewed and inspected; in April foreign-speaking soldiers of the mpire (to wit, the French-Canadians) for the first time in istory mounted the king's guard at Buckingham palace.

(L. H. D.)

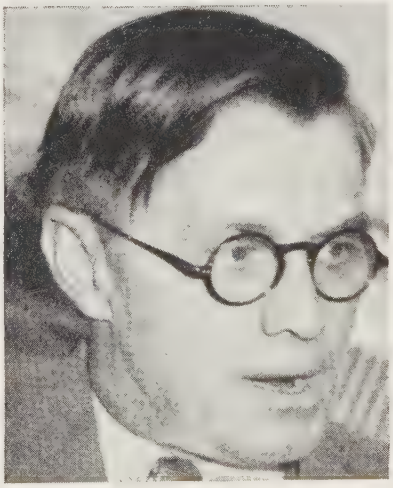
George II (1890–), king of Greece, was born at Tatoi near Athens on July 20, the eldest son of King Constantine, and succeeded to the throne for the first time in 922. Deposed March 25, 1924 after a series of uprisings, he pent the next 11 years in exile until his recall by the Greek ssembly in 1935. For his biography, see *Encyclopædia Britanica*, vol. 10, p. 192. On Oct. 28, 1940, the day that Italy began ts attempt to conquer Greece through Albania, George assumed ommand of the army. The next day he received a great demonstration of loyalty from his people in Athens and his popularity ncreased in proportion to the Greek successes in Albania. (*See* GREECE and EUROPEAN WAR.) On Dec. 3 he dispatched a plea or assistance to President Roosevelt and four days later received a promise of all possible aid. King George was divorced in 1935 rom Elizabeth, daughter of King Ferdinand and Queen Marie of Rumania, whom he had married in 1921. He is childless and has not remarried.

George, Walter Franklin (1878–), U.S. legislator, born Jan. 29 at Preston, Ga., began the practice of law in 1901 at Vienna, Ga. after graduating from Mercer university. In 1907 he became solicitor general for a state judicial circuit and by 1917 had advanced to the bench of the supreme court of Georgia. He became U.S. senator in 1922 and was re-elected for four consecutive terms. In 1938 he successfully withstood President Roosevelt's attempt to "purge" him in Georgia's senatorial election. George pursued his unreconstructed ways throughout 1939 and in 1940 attacked the administration for its delays in providing adequate national defence. He also criticized the selective service bill, the excess profits bill of 1940 and the failure of President Roosevelt to seek the advice of congress before consummating the destroyers-bases agreement of Sept. 3, 1940 with Great Britain. Later, however, after he was selected as chairman of the senate's foreign relations committee to succeed the late Key Pittman (*q.v.*) George said that his policy would be to "work in close harmony with the state department."

Georgia, one of the original states of the United States, popularly known as the "Empire State of the South"; area 59,262 sq.mi., being the largest east of the Mississippi river; population according to the U.S. census of 1940, 3,123,723, an increase of 7·4% over 1930. Capital, Atlanta, 302,288. The next largest city is Savannah, 95,996.

History.—Eugene T. Talmadge was elected governor in Nov. 1940 without opposition. In the September primary of the Democratic party Talmadge had easily defeated several opponents and in Georgia the Democratic nomination is the equivalent of election. Talmadge had already served two terms as governor (1932–36), and after the constitutional interval of four years he became the second man in the state's history to hold the office a third term, the other being the Civil War governor, Joseph E. Brown, who was governor four consecutive terms. The other principal state house officers elected were: John B. Wilson, secretary of state (re-elected); Ellis Arnall, attorney general; George B. Hamilton, treasurer (re-elected); Homer C. Parker, comptroller general; M. D. Collins, superintendent of schools (re-elected); Tom L. Linder, commissioner of agriculture. In the presidential election Roosevelt (Dem.) received 265,194 votes (approx. 85%); Willkie (Rep.) 23,934, (Ind. Dem.) 22,428; Babson (Prohibition) 983; Thomas (Soc.) 1.

Finance.—For the year ending June 30, 1940, the common schools received of state funds, $13,334,532; the various eleemosynary institutions, $1,842,210; and the university system (embracing all the higher educational institutions supported by the state), $1,824,525. The state appropriated for the public health department and the tuberculosis hospital $703,028. The highway department received $15,775,343. The total revenues received for the fiscal year amounted to $44,694,137, the tax on motor fuel producing the largest amount, $21,841,623. Other important sources were the income tax, $5,668,184; the general property tax, $4,995,013; cigar and cigarette tax, $3,127,225; motor vehicle registration, $2,053,692; insurance premiums tax, $933,-



EUGENE TALMADGE, Democrat, elected governor of Georgia Nov. 5, 1940

419; malt beverages and wine tax, $1,486,228; and alcohol beverage tax, $1,986,520. Georgia received from the United States government grants amounting to $10,961,991. The fixed debt was $27,088,616. According to the federal reserve bulletin the total assets of all Georgia banks in 1940 were $346,777,000.

Agriculture.—In 1935 there were 250,544 farms. Of these, 85,197 were operated by owners, the rest by croppers and tenants. In 1940 the value of the principal crops was $163,862,000, 14% above the corresponding figure for 1939. The most important cash crop was cotton, of which the yield was 1,020,000 bales valued at $48,450,000. Second in value among the cash crops was peanuts, $17,715,000, 57% above the 1939 figure. Third in value was tobacco, yielding $12,328,000, somewhat less than in the preceding year. Other important crops were: corn (not a cash crop), $31,857,000; sweet potatoes, $6,237,000; peaches, $5,192,000; pecans, $1,015,000. Cotton (lint and seed) accounted for 35·5% of the total value of crops; corn, 19·5%; peanuts, 10·8%; tobacco, 7·5%; all other crops, 26·7%. In 1939 the state had 970,000 cattle, 1,554,000 hogs, 31,000 horses.

Manufactures.—The census of manufacturing of 1937 credited Georgia with a total value of $708,652,000, about five times the value of the agricultural output. Since the raw materials of manufacturing are, however, largely agricultural in origin, a fairer comparison is that with "value added by manufacturing." In 1937 this value was $269,500,000, less than double the agricultural output, but still significant of trends in a primarily agricultural state. Textiles ranked first among manufactures, cotton goods having been turned out in 1937 to the value of $211,000,000. (R. P. Bs.)

Georgian S. S. R.: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

German-American Bund. The conviction of Fritz Kuhn on charges of theft and falsifying the records of the German-American Bund, of which he was the head, and his sentence to prison in New York in 1939 had a depressing effect on the organization. Kuhn, who before his conviction had appeared before the Dies Congressional committee investigating un-American activities, testified that there were 20,000 members of the bund in 19 states. G. Wilhelm Kunze, publicity relations director, who succeeded him as head of the organization, told a congressional committee in the summer of 1940 that the membership had fallen to 10,000 and that the number of separate units had decreased from 65 to 40. When the Selective Service bill was introduced in congress with a provision that no communist, anarchist or alien radical might be employed in war industries Kunze telegraphed to Washington demanding to be heard in opposition to its passage. He said that he had been informed that the bill explicitly excluded members of the bund from employment in United States industries, and further, that "the proposed legislation is damnable, vicious and a congressional declaration of war upon every German-American." Kunze also opposed the bill requiring all foreign-controlled organizations engaging in political activities to register with the attorney general, giving a list of all persons who contribute to it or pay dues, and requiring the officers of such organizations to report on their activities. His objection to the bill, which was ultimately passed, was that it would destroy the bund. Kunze, when summoned to appear before a subcommittee of the Dies committee investigating bund activities in New Jersey and the alleged connection between the bund and the Ku Klux Klan, denied that the bund had any connection with the klan, but admitted that it was committed to hostility to the Jews when it was necessary for self protection and that regardless of Germany's understanding with Russia the bund was still opposed to communism. In spite of the denial that the bund had any connection with the Ku Klux Klan 700 members of the New Jersey realm of the klan joined with about 700 members of the bund in a meeting in the bund camp in Andover, N.J., on Aug. 18. The klan members were escorted to the camp by members of the bund. Klan speakers expressed sympathy for the bund members who had been "persecuted for their adherence to the doctrines of nazi Germany," and condemned the Jews for "attempting to get this country into war." Not long after this meeting Kunze and eight other members of the bund were indicted on the charge of inciting to race hatred. The spokesmen for the bund insisted that only American citizens are admitted to membership. A former member, however, testified before the Dies committee that 25% of the members are alien Germans and that all received military training and are instructed to be prepared for the day when Hitler shall give the word to overthrow the government of the United States and set up a government based on the German model. The Federal Bureau of Investigation which has been looking into un-American activities has prepared an index of potential enemies of the United States. The index, it was announced, contains the name of every member of the bund.

Records seized at the Chicago headquarters of the bund Dec. 1 by the state's attorney's staff indicated that between 1,500 and 2,000 bund members were serving in the U.S. army and navy. The Federal Bureau of Investigation immediately examined the confiscated books and papers. (G. W. Do.)

Germany, a totalitarian state or dictatorship, known as the "third reich," in central Europe south of the North and Baltic seas and north of the Alps, Italy and Yugoslavia. From 1919 to 1939 East Prussia was separated from the main territory of Germany by the so-called Polish Corridor. Capital Berlin; reich chancellor and leader (*Fuehrer*), Adolf Hitler (*q.v.*).

Area and Population.—The area of the old reich was 181,74[illegible] sq.mi.; population 66,029,806, census of June 16, 1933. The population was distributed among the 18 "Lands" (former states) and among the chief religious denominations in 1933 as shown in Table I.

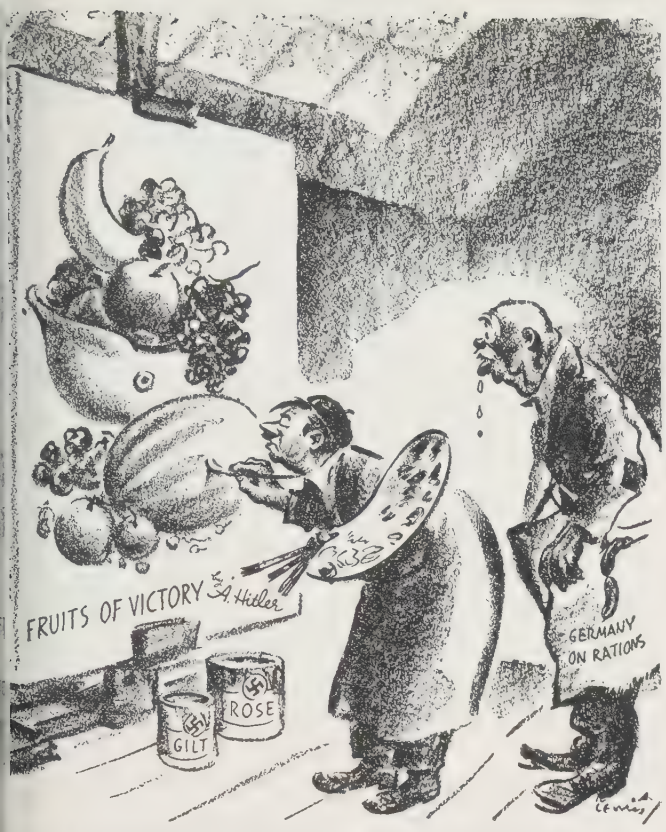
Table I.—*Population by Lands and by Faiths, in 1933*

Lands	Total pop.	Evangelical	Rom. Cath.	Jews†	Others
Prussia	39,692,167	25,387,595	12,571,007	361,826	1,613,583
Bavaria	7,681,584	2,203,499	5,370,719	41,939	65,427
Saxony	5,196,652	4,522,856	196,839	20,584	456,373
Württemberg	2,696,652	1,811,797	839,678	10,023	34,826
Baden	2,412,951	943,540	1,408,532	20,617	40,262
Hamburg	1,675,703	952,381	63,538	16,973	185,555
Thuringia	1,659,510	1,485,636	44,894	2,882	126,098
Hesse	1,429,048	933,473	439,048	17,888	38,639
Mecklenburg	804,948	704,794	31,831	1,003	7,535
Brunswick	512,989	454,250	21,904	1,174	35,661
Oldenburg	495,119	428,435	133,265	1,240	10,913
Bremen	371,588	317,188	24,122	1,438	28,810
Anhalt	364,415	320,708	13,008	901	29,798
Lippe	175,538	165,337	8,427	510	1,264
Schaumburg-L.	49,955	48,913	674	187	181
Saarland*	810,987	214,766	588,074	3,117	5,030
Germany	66,029,806	40,955,168	21,755,560	502,302	2,680,005

*Census of 1935. †Jews by religious faith; there are no census figures for Jews by blood; it was estimated that by the end of 1938 the Jews by faith had been reduced to less than 400,000.

There were (1933) 104 cities with a population of more than 50,000 each, and 567 cities and towns with more than 10,000 each. About 32·5% of the population lived in villages of less than 2,000; 10·6% in towns of between 2,000 and 5,000; and 7·3% in towns of between 5,000 and 10,000; almost half the population lived in communities of more than 10,000.

The population of the "greater reich," according to the census of May 17, 1939, was 79,592,000, or 86,400,000 if the "protectorate" of Bohemia-Moravia is included. This greater reich was created by Hitler's annexation of the following territories



STILL-LIFE BY ADOLF HITLER, as conceived by Lewis in the *Milwaukee rnal*. Says Hitler: "Don't eat, save your money, and you can own this master-ce"

n. 13, 1935, Saarland, 864,000; March 13, 1938, Austria, 7,008,-0; Oct. 1, 1938, Sudetenland, 2,945,000; March 15, 1939, Bo-mia-Moravia, 6,805,000; March 22, 1939, Memel territory, 3,000. In addition, by his war against Poland in Sept. 1939, tler added to the 86,000,000 of the greater reich the popula-ns of Danzig, the Polish Corridor, Posen and a strip of terri-y east of Silesia, regions aggregating 36,242 sq.mi., with a pulation of 10,000,000. The Poles, as far as possible, were terminated or removed from these conquered districts and their ces taken by Germans from the reich or by tens of thousands Germans "repatriated" from their old homes in Estonia, Lat-a and Lithuania. Hitler also conquered more than half of the t of Poland; its population of about 15,000,000 was organized der a national socialist administrator, Dr. Hans Frank, as the eneral government" of Poland. Poles, if loyal to their con-erors, were allowed to hold subordinate official positions. Half million Jews were herded into a walled ghetto in Warsaw.

The reich also controlled more or less completely the govern-nts of the populations conquered in the spring and summer of 40: Denmark (3,777,000), Norway (2,900,000), Netherlands ,640,000), Belgium (8,386,000), Luxembourg (300,000) and the rthern three-fifths of France, known as "occupied France" 17,000 sq.mi. with an estimated population of 27,800,000). The maining two-fifths of the former French republic, known as noccupied France," and the French colonial empire were left der the Vichy government of Marshal Pétain. Some 70,000 ench families were suddenly expelled from Lorraine to un-cupied France, and Lorraine ceased to exist. On Nov. 30, 1940, was incorporated directly into the "third reich" and combined th the Saar territory under *Gauleiter* (District Leader) Joseph erckel as the "Westmark"; this corresponds to the former stria which became the "Ostmark" upon its annexation by Hit-in 1938. Alsace, from which French families were also ex-lled in large numbers, was placed under the administration of Robert Wagner, *Gauleiter* of Baden.

In addition, by the infiltration of large numbers of German troops, the reich dominated in the autumn of 1940 the three Danubian countries: Slovakia, Hungary and Rumania.

History.—After the lightning war (blitzkrieg) against Poland in Sept. 1939, Hitler's armies remained comparatively quiet for six months, except for mopping-up operations in conquered Poland. He did not attack the strong French Maginot line in the west because it would be too costly in life, and because he at first hoped to detach France from Great Britain by a separate peace. So for seven months the war in the west was a sitzkrieg in which the French and German soldiers spent most of their time sitting in the strong defensive fortifications of the Maginot line and the Westwall.

On April 9, 1940, Hitler suddenly renewed his blitzkrieg tactics by an invasion of Denmark and Norway. In Denmark King Christian, seeing that resistance would be useless, accepted German "protection" and was allowed to remain as nominal ruler while German troops and police occupied and controlled his kingdom. In Norway German troops, with the aid of German spies and "fifth columnists," seized the principal ports within a few hours. King Haakon and his ministers fled from the capital, Oslo, and the Norwegian people, recovering from their surprise and consternation, attempted to defend their independence. British and French troops, landing at Narvik and near Trondhjem, tried to aid them, but were forced to withdraw. Within two months, by June 9, Hitler was in virtual control of all Norway. He placed the administration in the hands of a nazi commissioner, Josef Terboven, aided by a Norwegian traitor, Vidkun Quisling. King Haakon, his ministers and many Norwegians fled to England to carry on the struggle from abroad.

On May 10 Hitler began a similar blitzkrieg against his neighbours in the west. The Netherlands was overrun in five days and placed under the rule of Dr. Arthur Seyss-Inquart, the nazi who had helped Hitler to seize Austria in 1938. Queen Wilhelmina fled to England and retained her rule over the Dutch colonies. Belgium was likewise overrun in 18 days. On May 28 King Leopold surrendered his army and was allowed to remain as nominal ruler, but his country was completely under German domination.

French and British forces, advancing too far in coming to the aid of the Belgians, were cut off and pocketed by rapidly moving German tanks and mechanized troops and forced to retreat toward Dunkirk. From this channel port about 355,000 French and British were evacuated with remarkable success and heroism between May 29 and June 4. Hitler might possibly have succeeded in invading England at this time if he had tried, but he preferred to push quickly deep into France, where the ministers, divided against themselves, asked for an armistice, which was signed on June 22. By its terms German troops were to occupy the northern three-fifths of France until a final peace was signed, while unoccupied France, the French fleet and the colonies were left under the rule of Marshal Pétain and his government at Vichy.

Hitler failed to crush Britain, though he had promised his people he would do so by the middle of August. From the outset of the war he tried to weaken Britain by attacking its commerce and supplies from overseas. Within 16 months his mines, submarines, surface-raiders and air-bombers had sunk more than 4,000,000 tons of British and Allied merchant shipping. In Aug. 1940 his planes began to rain a terrible destruction on London and other British cities. But these attacks did not weaken the British determination to continue the war for the overthrow of the nazi domination of Germany and Europe, nor did they weaken Britain sufficiently for Hitler to attempt his much-talked-of invasion of England.

In the summer of 1940 German troops entered Rumania in large numbers, caused the flight of King Carol and helped establish a pro-nazi Iron Guard regime. In Jan. 1941 German troops were massed on the frontier of Bulgaria as if to attack the British in the eastern Mediterranean area or to aid Italy against the victorious Greeks in Albania.

Education and Religion.—Education has gone through a drastic reorganization under nazi rule. The period of school attendance was shortened by one year in 1937. Many new schools have been established for giving a year or two of professional or technical training; for many students this will replace the last years at the regular schools or at universities and the older technical institutes (*Hochschule*). Many schools have also been established for training "leaders" for the nazi Party and for government positions; emphasis in them is placed on comradeship, sports, nazi ideology and leadership.

Attendance at Germany's universities has been considerably cut down since the nazi revolution, partly owing to government restrictions upon attendance, partly owing to the decline in the quality of teaching as a result of the dismissal or resignation of Jewish and liberal professors, and partly owing to other causes. The government tends to shift students from the large city universities to the smaller town universities, especially those in eastern Germany, where nazi influence is stronger. Thus, the figures for attendance in the winter semester of 1929–30, and the limiting quotas fixed by Bernhard Rust, the reich minister of education, for the winter semester of 1937–38, were for the larger universities respectively: Berlin, 16,149, 6,000; Cologne, 7,162, 2,400; Frankfurt, 5,242, 1,700; Hamburg, 3,995, 1,700; Munich, 9,028, 4,800.

By the end of 1939 there was a serious shortage of schoolteachers, skilled engineers and members of some other professional classes. As a result, university attendance again increased in 1940, especially in the technical and national science departments.

The Evangelical Protestants and the Roman Catholics, whose numbers and distribution are given in the table on p. 316, have suffered what they regard as severe persecution under the nazi regime. The Protestant regional churches took steps in 1933 to form a single reich church in accord with Hitler's general policy of centralization. But aggressive nazis, who ordinarily selc attended church and who indulged in semipagan views, mobil their efforts to secure the election of Ludwig Mueller as r bishop of the new church. This caused a split, which has gr deeper and deeper, between the official Evangelical Church and really devout Christian Opposition pastors and their followers by Dr. Martin Niemoeller who has been in a concentration c for several years.

Pope Pius XI signed with Hitler in 1933 a concordat guaran ing to the Roman Catholics the free exercise of their relig their religious schools and their various religious youth, pro sional and charitable organizations. The guarantees have not b observed. The Vatican radio broadcast on Jan. 28, 1940, part a long memorandum by Cardinal Hlond, primate of Poland. T full text of 11,000 words was given to the press by the Po embassy at the Vatican. It gave proof of the terrible perse tions of Roman Catholics after the German conquest of Pola It recited, with precise names and places, the long list of pri shot or beaten to death; of 631 churches, 454 chapels and religious ruined or plundered; and of religious publications s pressed. Hitler's foreign minister, Joachim von Ribbentrop, his visit to Rome on March 10 had a 65-min. audience with P Pius XII, but it was reported that the meeting was a very c one. The German Roman Catholic bishops held their ann meeting at Fulda in August, but it was stated that their past letter would not be published as usual, but would be withh until the end of the war.

Finances and Banking.—No exact statement can be mad regard to the German government's revenues and expenditures the budget has not been published since 1935. The taxes collec by the reich central government have quadrupled since Hi came to power, being about 6,000,000,000 marks for 1932–33, officially estimated at more than 26,000,000,000 for the fi year ending March 31, 1941. This does not include about 5,0 000,000 marks levied by the "Lands" and local communi (*Gemeinde*).

The war economy decree of Sept. 4, 1939, increased the rat taxation on many objects, but the increase was not as large might have been expected in a nation at war, because Germ for some years had been virtually on a wartime economy. I illustrate what he called the comparatively slight tax incre caused by the war, the state secretary of the reich finance mini on Aug. 23, 1940, gave comparative figures for collections f six of the larger tax sources for the April-July period of 1939 his estimates for the same four months in 1940; his figures millions of marks, are shown in Table II.

Table II.—*Comparative Tax Collections for Four Months, 1939 and 194*

Four months' tax	Collected in 1939	Estimated for
Wage tax	876.8	934.5
Income tax	1,430.0	1,503.2
Sugar tax	132.2	153.1
Beer tax	196.4	204.9
Tobacco tax	355.3	471.3
Property tax	106.2	126.5
Totals	3,096.9	3,393.5

The exact debt is also unknown because the large amounts treasury bills issued to build armaments, auto highways and ot public works are not counted in the debt until they fall o Between 1935 and Sept. 1939 the government publicly increa the reich debt by issuing 13 long-term loans totalling over 15,0 000,000 marks, in order to take care of treasury notes as t fell due and to consolidate the short-term indebtedness. Th

ON THE MORNING of April 9, 1940, the day Germany invaded Norway, For Minister von Ribbentrop (leaning on table) explained to a press conferenc Berlin that the invasion's purpose was to protect Norway from Great Britain France

VN STREETS STREWN WITH FLOWERS by Hitler Maidens the Fuehrer e his triumphal return to Berlin July 6, 1940 from the western front

ıs all bore $4\frac{1}{2}$% interest, were issued at $98\frac{3}{4}$ and were quoted Jan. 1941 at about 102. They do not include two 5,000,000-rk loans issued by the state railway (*Reichsbahn*) in 1936 and 9, nor loans by other government enterprises. At the beginning he war the government ordered the establishment of a credit 15,000,000,000 marks, and in April 1940 issued 4,000,000,000 ks' worth of treasury notes bearing interest at 4% instead of previous rate of $4\frac{1}{2}$%. It was announced that new treasury es to be issued in Jan. 1941 would bear only $3\frac{1}{2}$% interest.

he officially recorded debt of the reich on Aug. 31, 1940, was 66,500,-000 marks, indicating that the total borrowings during the first year he war were 29,000,000,000 marks; *i.e.*, that the debt had nearly bled. These figures, however, are generally considered by foreign ex-s to be much smaller than the real debt. It was estimated that the thly increase in the debt during the last four months of 1940 was ıt 3,000,000,000 marks a month.

he cost of building Germany's war machine was publicly stated by er on Sept. 1, 1939, to have been 90,000,000,000 marks (about $36,-,000,000). The cost of running the war machine averaged about 0,000,000 marks a month during 1939 and rose to nearly 5,000,000,000 ks a month during the last half of 1940. About half the monthly cost met from current taxation, and the other half by government borrow-from savings banks, insurance companies and other public credit insti-ons. After June 25, 1940, when the armistice with France became tive, the French became obligated to bear about 15% of the German cost, because they had to pay for the support of the large German ies in "occupied France," amounting to about 600,000,000 marks a th. In addition, France had to pay for the support of more than 0,000 French prisoners in Germany. The protectorate of Bohemia-avia likewise was assessed approximately 200,000,000 marks a year in rn for its exemption from maintaining an army of its own, after the ı army became guarantor of the protectorate's security.

he reichsbank's gold and foreign exchange reserves, which were about 0,000,000 marks in 1932, had shrunk, according to its official reports, 5,566,000 marks on Dec. 31, 1940. It afforded only a 0.53% coverage paper money, as compared with 24.3% in 1932, and with the 40% ch before the World War of 1914–18 was considered the lowest cov-e compatible with safety. The reichsbank paper bank note circulation Dec. 31, 1940, was the largest in its history, being 14,033,000,000 ks, as compared with 11,798,000,000 and 8,222,000,000 at the end 938 and 1939 respectively. This increase in paper money and govern-t borrowing and spending would normally tend toward an inflation of es and a rise in the cost of living, but the government by very rigid rol of wages and prices managed to keep the price level close to t it was at the outbreak of war. Most of the countries conquered during o succeeded in getting a large part of their national gold reserves to es of safety before the Germans could seize it. Nevertheless, the Germans probably acquire considerable amounts of gold and foreign exchange ch they did not publish in their reichstag reports, but which were used buying war materials, propaganda abroad and other war purposes, which was being secretly hoarded for future war uses.

he standard of currency is the German mark, equivalent in U.S. money 0.3325 cents. Owing to the government's rigid control, its official exchange value is kept very close to its American and foreign equivalent, but in fact there are many kinds of marks whose actual value depends on where and by whom they are used. There is also a special mark paper currency for use in several of the lands occupied by German troops.

Trade and Communication.—Since 1935 Germany's exports and imports have been very strictly controlled, first by Dr. Schacht's "new system," then by Goering's dictatorial economic power as commissioner for the four-year plan, and finally by the ministerial council for reich defence, established by Hitler on Aug 30, 1939, and headed by Goering with sweeping powers to co-ordinate economic and administrative activity. Germany's imports and exports and resulting balance of trade during the years 1932–39 are shown in Table III.

Table III.—*Imports, Exports and Balance of Trade, 1932–39*

	Total Yearly			Monthly Average		
	Imports Million marks	Exports Million marks	Balance Million marks	Imports Million marks	Exports Million marks	Balance Million marks
1932 . . .	4,667	5,739	+1,072	389	478	+89
1933 . . .	4,204	4,871	+ 667	350	406	+56
1934 . . .	4,451	4,167	− 284	371	347	−24
1935 . . .	4,159	4,270	+ 111	347	356	+ 9
1936 . . .	4,218	4,768	+ 550	352	397	+46
1937 . . .	5,468	5,911	+ 443	456	493	+37
1938* . . .	6,052	5,620	− 432	504	468	−36
1939† . . .	2,755	2,814	+ 59	458	468	+10

*Figures do not include Austria and Sudeten area.
†Figures are for the first six months of 1939 only.

The above figures show that the imports tend to increase, especially in 1937 and 1938, while the exports increase less, with the result that the balance of trade becomes less favourable. Among the reasons for this is the fact that Germany has increased its imports of raw materials for its rapidly growing armaments, and to some extent its imports of food for its people and fodder for its cattle. The figures do not include the exports and imports of the annexed Austrian and Sudeten territories. If they did so, the deficit in the trade balance would have been greater in 1938, since Austria and the Sudeten territories have always had to import a larger proportion of their food than has Germany; as far as Germany's food problem goes, these two territories are a liability rather than an asset to Germany.

With the outbreak of war Germany ceased publishing official statistics so that no exact trade figures were available for 1940. From other sources, however, it is clear that Germany was at once cut off from almost all its overseas trade and thus deprived of half of its normal foreign commerce. To compensate for this loss it sought to intensify its trade with its immediate continental neighbours by trade agreements: with the soviet union in Oct. 1939 and in Feb. and Dec. 1940; with Rumania on Dec. 4, 1940, for the delivery of 3,000,000 tons of oil during 1941; and with Sweden on Dec. 18, 1940, for an increase by one-half of the existing trade between the two countries. By these and other trade agreements, Germany aimed to get food, fodder, iron ore, bauxite, petroleum products and other war materials, in exchange for German coal, machinery and manufactured goods. By its much-advertised "new order" in Europe it also sought to make Berlin as much as possible the trading centre for continental Europe by making its neighbours clear their trade accounts in marks through Berlin as a clearing centre instead of settling their accounts directly with one another.

Enemy countries and neutrals had accounted before the war for a large proportion of the reich's imports of strategic raw materials—98.5% of the cotton, 87.7% of the copper, all of the rubber and 44.1% of the iron ore. Gasoline and lubricants continued during 1940 to be one of the reich's most serious needs, since the annual domestic production of 4,000,000 tons of synthetic gasoline, plus imports from Rumania and Russia, hardly sufficed to meet German industrial and war demands. By its conquest of the Belgian and French iron and coal industrial areas and by the agricultural and dairy products of conquered Poland, Denmark and the Netherlands, Germany was able to improve considerably its war economy during 1940 and partly offset the effects of the British blockade. Tariff charges were abolished between the reich and Bohemia-Moravia on Sept. 15, 1940, and between the reich and the Netherlands on Dec. 18.

The German state railway (*Reichsbahn*) included in 1938, prior to the annexation of Austria and other lands, 53,330 km. (33,076 mi.) of standard-gauge lines and 879 km. (546 mi.) of narrow-gauge lines. Privately owned lines included 3,732 km. (2,313 mi.) of standard and 752 km. (476 mi.) of narrow gauge. Owing to Hitler's great efforts at rearmament and public works, the railways were not kept up in proper repair with adequate replacement of roadbed and rolling stock. As a result the railways had difficulty in meeting the added strain of war. This was particularly true in the case of hauling oil in tank cars from Rumania and in making coal deliveries to Switzerland, Italy and throughout the reich during 1940. In Nov. 1939 the German railway floated a loan of 500,000,000 marks to add new rolling stock and to improve and extend the rail network to the east.

By the middle of 1939 Germany had completed and opened to traffic 3,065 km. of the new automobile highway network (*reichsautobahn*); 1,383 km. were under construction and preliminary work was proceeding on 2,449 km. The outbreak of war compelled Germany to cut this building program by half. Work was continued only on those stretches which were of greatest strategic or economic importance, particularly in linking Germany with its newly acquired territories in the east. The volume of motor traffic was also sharply curtailed for the duration of the war in order to economize on gasoline. The number of private autos in circulation was cut to 15% of the prewar total. Many trucks were converted to use methane or butane gas instead of gasoline as a motor fuel.

Table IV.—*Agricultural Production from 1932 to 1939*
(In thousands of metric tons)

	Rye	Wheat	Barley	Oats	Potatoes	Sugar Beets	Fodder Beets
1932	8,303	5,003	3,214	6,650	47,016	7,875	34,486
1933	8,727	5,604	3,468	6,952	44,071	8,578	30,716
1934	7,007	4,532	3,203	5,452	46,780	10,394	33,804
1935	7,478	4,007	3,387	5,385	41,015	10,567	34,711
1936	7,386	4,426	3,399	5,618	46,323	12,095	37,826
1937	6,920	4,580	3,640	5,920	53,000	15,701	40,538
1938	8,403	5,502	4,177	6,274	48,700	17,200	41,700
1939*	—	—	—	—	54,540	17,400	39,500

*Figures for 1939 are estimated. The total grain harvest was estimated at 27,430,000 metric tons, *i.e.*, 6.4% more than the total for 1938.

German inland shipping at the beginning of the war included 5,373 vessels moving under their own power and totalling 528,000 tons; and 12,488 canal boats and other vessels without power, totalling 5,835,000 tons. High seas shipping included 3,579 vessels with a total registered net tonnage of 2,238,000. During the war, aside from trade in the Baltic, German ocean-going vessels were mostly kept tied up in home ports or in neutral ports abroad. Some vessels which were caught by the British at the beginning of the war or which tried to return home, like the luxury liner "Columbus," were sunk or captured by the British or scuttled by their own crews. Such German shipping losses are estimated to have totalled more than 1,000,000 tons.

Agriculture, Manufactures, Mineral Production.—Germany's agricultural production in the prewar years in thousands of metric tons was as shown in Table IV.

The grain harvests of 1940 were officially stated to be "average good," but no exact figures were published. The sugar-beet and potato crops of 1940 were said to be particularly good, exceeding those of 1939 and providing an exportable surplus, besides yielding ample quantities for foodstuffs and fodder. The potato yield was said to be 57,000,000 tons, the largest in Germany's history.

The latest available figures for Germany's mineral and manufactured products, in metric tons, are shown in Table V.

Table V.—*Production of Minerals and Manufactured Products, 1933–37*
(In metric tons)

	1933	1934	1935	1936	1937
Coal	109,532,600	125,405,600	143,491,300	159,756,600	184,500,000
Lignite	126,756,600	137,223,400	147,162,100	161,426,900	184,700,000
Iron Ore	2,592,000	4,343,000	6,044,000	7,570,000	9,792,000
Lead	91,000	98,400	122,300	139,000	158,500
Zinc	162,000	212,800	205,000	207,700	194,300
Rock salt	1,841,300	2,024,200	2,077,200	2,383,800	2,767,000
Potash	7,362,800	9,616,700	11,672,500	11,764,600	14,460,000
Pig iron	5,246,500	8,716,700	12,846,200	15,302,500	15,960,000
Steel	7,393,200	11,601,700	10,013,500	18,590,900	19,387,000

As a result of Germany's conquest of the resources of Austria, Czechoslovakia, western Poland, Belgium and northern France, its mineral and manufacturing products were greatly increased, but they mostly had to be devoted to war purposes so that it was in a less favourable position to export goods. Increased capital and labour were devoted to the production of substitute (*Ersatz*) products—synthetic gasoline, rubber, soap, textiles, plastics—in place of imported goods or goods made from imported raw materials. Many of these substitutes are fairly satisfactory, but they require more labour and cost more than the old natural products. Even before the war, Germany suffered from a labour shortage; this became more serious with the mobilization of men into the army. The labour shortage in 1940 was partly met by bringing in large numbers of captured Poles, Belgians and Dutch to work in German fields or factories; French prisoners, who numbered nearly 2,000,000, were also in many cases set to work. Some 70,000 Italians went to work in the reich.

(*See* also ANTI-SEMITISM; ARMIES OF THE WORLD; BALKAN ENTENTE; BOHEMIA AND MORAVIA; BRAZIL; COMMUNISM; CZECHOSLOVAKIA; EDUCATION: *General World Trends;* EUROPEAN WAR; FASCISM; MINORITIES; PROPAGANDA; RELIGION; ROMAN CATHOLIC CHURCH; RUTHENIA; SLOVAKIA; UNITED STATES; YOUTH MOVEMENTS.)

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Gibbs, George (1861–1940), U.S. engineer, was born in Chicago, April 19, and was graduated from the Stevens Institute of Technology in 1882. After serving with western railroads he became consulting engineer for the Baldwin Locomotive works in 1897. He was also employed by the Westinghouse interests. He had charge of the electrification of the Pennsylvania and the New York Central railroad systems and built the first all-steel railroad car. He was president of the American Institute of Electrical Engineers. He died in New York city May 19.

Gibraltar: *see* BRITISH POSSESSIONS IN THE MEDITERRANEAN.

Gibson, Ernest Willard (1871–1940), U.S. senator, born in Londonderry, Vt., 29. He was graduated from Norwich university in 1894 and s ied law at the University of Michigan in 1898–99 after ha served four years as the principal of the high school in Che Vt. He began to practise law in Brattleboro, Vt., in 1899. was a member of the Vermont house of representatives in and the senate in 1908. He was elected to the U.S. house representatives in 1922 and served continuously until he was pointed in 1933 to fill a vacancy in the senate. He was ele to a full term as U.S. senator in 1938. In the senate he serve a member of the committee on naval affairs. He died in Wash ton, June 20.

Gilbert and Ellice Islands Colony: *see* PACIFIC ISLA BRITISH.

Gill, Eric Rowland (1882–1940), British sculptor, born in Brighton, Feb. 22, and die Uxbridge, Nov. 17. For a biographical sketch see *Encyclop Britannica,* vol. 10, p. 353.

Gilmour, Sir John (1876–1940), British statesman, born May 27. After studying at E burgh and Cambridge universities he entered the army, ser in the Boer war in 1900–01. Soon after his return to Englan was elected to parliament and served a total of 22 years. fought in the World War of 1914–18, rising to the rank of L tenant colonel. He entered the cabinet in 1926 as secretary state for Scotland. He served successively as minister of agri ture and as secretary of state for the Home department. Pr Minister Chamberlain made him minister of shipping in 1939, and gave him control of the entire merchant fleet. He in London, March 30.

Gin: *see* LIQUORS, ALCOHOLIC.
Ginger: *see* SPICES.

Girl Scouts. In response to world needs, Girl Scouts in put increasing emphasis on citizenship service activities. Service bureaus were organized in score communities throughout the United States. These bureaus a as clearing houses for local agencies to make known their n and for Girl Scouts to register for useful community ser Girls volunteered thousands of hours of work in day nurse clinics, settlements, playgrounds and the offices of welfare gro

War in Europe made it impossible to hold the usual inte tional gathering at Adelboden, Switzerland. Instead, Girl Sc of the United States were hostesses to Girl Guides from Can Newfoundland, Cuba, Jamaica, Trinidad, Curaçao, Mexico, ama, Guatemala, British Guiana, Brazil, Bermuda and Argen at a western hemisphere encampment held at Camp Andree, Pleasantville, N.Y. The newly formed western hemisphere ce of the World Bureau of Girl Guides and Girl Scouts carried many of the suggestions made by the girls at this encampmen

Their sister scouts and guides in war-torn countries were forgotten. Thousands of dollars, contributed in pennies by Scouts all over the country, were sent to China and to Eur A Christmas present to the Girl Guides of Great Britain made up of two mobile canteens, an ambulance, 90 air raid sh units and 330 lb. of knitting wool.

At the end of 1940 there were approximately 640,000 mem of the Girl Scout organization in the United States. Of th about 100,000 were adults, the rest, girls ranging in age f seven to eighteen. (C. M. R

ands and Hormones: *see* ENDOCRINOLOGY; MEDICINE.

ass. During 1940, the importation of glassware from Europe practically ceased. As a result, a number of small items herto exclusively imported began to be produced in America. ıong these were microscope slides and cover glasses. The nestic production of optical glass was stimulated, and the me- ınical production of Christmas tree ornaments became impor- ıt. Successful processes were announced for the treatment of faces of optical glass to eliminate reflection and increase trans- ssion and definition of camera lenses and other lens systems. The design of machine-blown bottles was improved by round- off the angle at the base, reducing sensitivity to pressure and ɔck. Progress was made in the production of bottles of light ight and even distribution of glass. The year's production of tles and containers is estimated at 58,000,000 gross.

Window glass production was estimated at 600,000,000 sq.ft. 80% of capacity and plate glass production exceeded 150,000,- ɔ sq.ft., most of it made for automobiles. Glass building blocks gan to be made in quantity, establishing a virtually new lustry.

The effect of improved methods of mechanical production was lected in the report of the 1939 Census of Manufactures which ve the number of operating glass plants in the U.S.A. at 229, e lowest in several decades. The total value of glassware manu- tured was given at $358,000,000.

Under the name of "Pyrex Vycor" the high-silica glass an- unced in 1939 was in 1940 being made in a number of labora- y utensils. The coefficient of expansion of this glass is less an 8×10^{-7} which is less than 1/10 the expansibility of ordinary ttle glass.

Mirror manufacture was improved and cheapened by the in- ɔduction of the Peacock process in which the silvering solution th its reducing agent is sprayed upon the glass, and an adherent ating of silver is almost instantly deposited.

The federal suit against patent-holding companies was not de- led by Jan. 1, 1941. (*See* also FELDSPAR; SELENIUM.)

(S. R. S.)

enn, Mary Willcox (1869–1940), U.S. welfare worker, was born in Baltimore, Dec. 14. e was secretary of the Children's Aid society of that city from 97 to 1901. In 1902 she married John Mark Glenn, a lawyer New York city, who became a general director of the Russell ge foundation. She was president of the National Confedera- n of Charities and Correction in 1915 and from 1919 to 1937 s president of the National Council of the Church Mission Help. She died in New York city, Nov. 3.

iding. Progress in American motorless flight in 1940 continued at a steady pace, slow compared to that of ıer nations prior to the war, but creditable considering the k of any government subsidy. The "Golden C," highest inter- tional rating, is held by four Americans: Robert Stanley, John ɔbinson, Chester Decker and Lewin Barringer.

The 11th annual National Soaring contest was held at Elmira, Y., in June. There are five annual, regional contests at Arvin, lif.; Wichita Falls, Tex.; Frankfort, Mich. (in 1940 at Joliet, .); Liberty Corners, N.J. and Wurtsboro, N.Y. Three sail- ıne factories were established: Bowlus in Los Angeles, Frank- t in Joliet, and Schweizer in Elmira.

Two new records were set: John Robinson, the new American ıring champion, made a national distance record on July 13 by ıring his Ross "Zanonia" 290 miles from Elmira to Richmond, . Lewin Barringer, whose book, *Flight Without Power* ap- ared in June, set a two-seater altitude record of 13,700 feet

TWO GLIDERS collided and their pilots crashed to death at the western championship soaring contest, Arvin, Calif., in 1940

with a Schweizer sailplane on Aug. 19 during an expedition to test conditions at Sun Valley, Idaho. This flight was started by utilizing a "dust devil" or thermal, made visible near the ground by whirling, rising dust, and reached a height of over 20,000 feet above sea level. The flight is expected to be recognized as an international record, the first in America for six years.

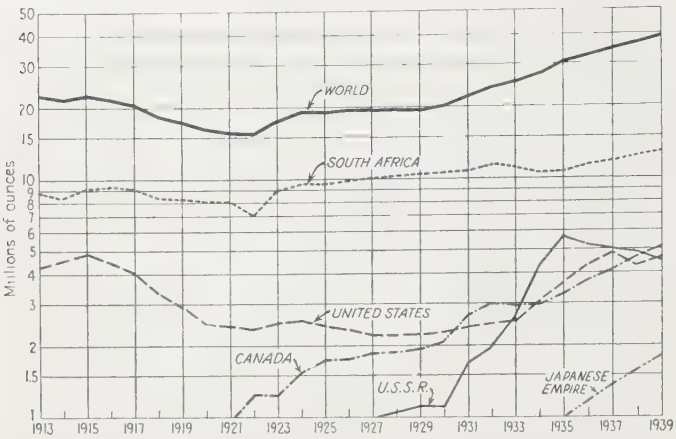
(L. B. BA.)

G-Men: *see* FEDERAL BUREAU OF INVESTIGATION.

Goering, Hermann Wilhelm (1893–), German reichsmarshal and statesman, was born at Rosenheim, Bavaria, on Jan. 12 and was commander of the famed Richthofen squadron in the German air force during the World War of 1914–18 after Richthofen's death. Goering was an early member of the nazi party and became air minister and minister of the interior in 1933 upon Hitler's accession to the chancellorship. See *Encyclopædia Britannica,* vol. 10, p. 532.

Goering was with Hitler at the western front throughout the campaigns of May and June, 1940 and personally directed operations of the *luftwaffe* against Great Britain. In September he was reported to have flown in a German bomber over London during a raid on the British capital. On July 19, 1940 Hitler conferred the newly-created title of marshal of the reich on Goering and declared before the reichstag that his trusted aide, as creator of the German air force, "has individually made the highest contribution to the reconstruction of the German army." Goering, who was appointed head of the economics general staff on Jan. 4, had in 1940 supreme control over Germany's economic life.

Gold. Reacting to the continued open market and increased price, gold production established another new record output in 1939, for the eighth consecutive year. Production is so widely scattered, and figures from many of the smaller and more remote producers are so slow in arriving that in 1940 it was impossible to arrive at an accurate figure for the 1939 total; since the latest production tabulation to arrive listed no less than 90 producing countries, this condition was not surprising. The situation was further complicated by the fact that no statistics were published for the soviet union, the second largest producer, so that only estimates for the world total could be presented. As a result, it was becoming customary for statistical agencies to report the total of other production, omitting the Russian output entirely. On this basis, using the latest data available, the world gold output in 1939, excepting the soviet union, was 34,500,000



GOLD PRODUCTION: world total and output of the principal producing countries (*The Mineral Industry*)

oz., an increase of 9% over 1937. The various estimates on the Russian output varied around 5,000,000 oz. This would indicate a world total somewhere near 39,500,000 oz. The production rate continued to expand in 1940 and the total, excepting the soviet union, for the first eight months of the year was 24,105,000 oz., an increase of 7·5% over the same period of 1939, indicating another new record for the year's total.

South Africa continued to hold pre-eminence, with a total of 12,821,500 oz. in 1939 and an increase of 10% in the first ten months of 1940 over the same period of 1939. The lowering of the average grade of ore treated, which dropped from 0.2253 oz. per ton in Jan. 1938 to 0·2051 oz. in Jan. 1939, did not continue in 1939, but rose to 0·2073 oz. in Sept. and was at approximately the same level in July 1940.

Total mine production of recoverable gold in the United States (territories included) was 5,905,052 fine ounces in 1940, an increase of 4% over 5,672,485 ounces in 1939, according to preliminary figures of the Denver office of the bureau of mines, United States department of the interior. The value of the gold calculated at $35 per fine ounce was $206,676,820 in 1940 and $198,536,975 in 1939. Of the total production in 1940, California contributed 24%, Philippine islands 18%, Alaska 13%, South Dakota 10%, Colorado 6%, Nevada 6%, Utah 6%, Arizona 5%, Montana 5% and other states 7%.

Canada in 1939 stood third, with an output of 5,094,000 oz. There was a smaller advance in production rate in 1940, the total for the year being estimated at 5,335,000 oz., an increase of 4·8%. This placed Canada in an intermediate position, third in rank after the United States, including the Philippines, but second ahead of the United States, as compared with it alone.

The position of the soviet union was indefinite since the actual magnitude of the output was a matter of pure conjecture, with opinions varying within wide limits. However, there seemed to be pretty general agreement that the Russian output had been declining since 1935 and it would seem to rank about on a par with United States or Canada.

The only other individual producer having an output in excess of 1,000,000 oz. was Australia, with 1,625,000 oz. in 1939. The Japanese empire had an estimated output of about 1,885,000 oz. in 1939, from Japan proper, Chosen (Korea), and Taiwan (Formosa), an increase of 6·6% over 1938.

The price of gold in London rose steadily from 150*s*.0½*d*. on Jan. 2, 1939, to 160*s*. on September 1. With the outbreak of war with Germany, the price was fixed at 168*s*. on September 5, and this was maintained to the end of 1940, with dealings in gold prohibited except through official channels, and the requirement that all coin or bullion be sold to the Government. (*See* also Federal Reserve System; Gold Reserves and Gold Standard; Mineral and Metal Prices and Production.) (G. A. Ro.)

Gold Coast: *see* British West Africa.

Golden Gate International Exposition: *see* Art Exhibitions; Art Galleries and Art Museums; Electric Lighting; Fairs, Exhibitions, Expositions; San Francisco.

Goldman, Emma (1869–1940), international anarchist, was born in Kovno, Lithuania, on June 4. The daughter of the manager of the subsidized theatre there. Her youth was spent in Koenigsberg and St. Petersburg. When she was 17 years old she went to America and worked in a factory in Rochester, N.Y., and later in New Haven, Conn., where she first became associated with anarchists and espoused their views. In 1889 she went to New York city, where she met Alexander Berkman, who attempted to assassinate Henry C. Frick in Pittsburgh during the Homestead steel strike in 1892.

She resumed the association after Berkman completed a 14 year sentence in prison. She was sent to prison herself in 18[illegible] for inciting a riot. During the World War of 1914–18 she and Berkman were convicted of interfering with war preparations and were sentenced to prison. Both were deported from the United States on Dec. 1, 1919. They went to Russia but disapproved of the soviet regime and travelled to England and thence to Canada. She edited anarchist periodicals and was the author of two books on the U.S.S.R. She died in Toronto, May 14.

Gold Reserves and Gold Standard. The year 19[illegible] did not prove [illegible] any break in the trend which has seen the use of the gold standard decrease as the gold reserves of the world have increased. Here gold the features of the year were (1) an enlargement in the already heavy flow of gold to the United States; (2) a breakdown in the foreign exchange dealings between the United States and virtually the whole European continent; and (3) a substantial increase in the production of gold.

After having averaged $1,400,000,000 annually from 19[illegible] through 1937, net gold imports into the United States rose to $1,974,000,000 in 1938 and then, in 1939, to the record high total of $3,574,000,000. It did not seem possible that the movement of gold into the United States could exceed the 1939 figure which had resulted from the headlong flight of capital from Europe immediately preceding and immediately subsequent to the outbreak of war. But 1940 was capable of a still mightier effort. There were two main forces which operated in 1940 to enlarge to new record high levels the shipments of gold to the United States. One of these was the desire of Great Britain to transfer the bulk of its gold reserve to the United States for use in paying for the exceptionally large orders for war materials which the British Purchasing commission was placing. The other main drive behind the westward movement of gold across the Atlantic was the abrupt need which the Scandinavian nations, Belgium, the Netherlands and France faced of getting their gold reserves beyond reach of the invading German armies.

Thus there was a dual purpose behind the gold movement from Europe to the United States. The transfer of gold reserves from Europe to the United States for safekeeping purposes found reflection in the increase in the amount of gold under earmark at the Federal Reserve banks from $1,163,000,000 at the close of 1939 to $1,815,000,000 as of Nov. 30, 1940. This same influence was mirrored also in the expansion in foreign deposits with the Federal Reserve banks from $408,000,000 on Dec. 27, 1939, to $1,153,000,000 on Nov. 27, 1940, the latter the highest total ever attained by these deposits.

In the first 11 months of 1940, according to statistics compiled the department of commerce, gold imports into the United ıtes aggregated $4,612,000,000, as against $3,574,000,000 in of 1939. The table shows a comparison of the gold receipts the first 11 months of 1940 and all of 1939.

Gold Receipts of the U.S., 1940 and 1939

(000's omitted)

	1940*	1939		1940*	1939
ınada	$2,542,111	$ 613,116	Australia . . .	$88,783	$ 74,250
ıited Kingdom	633,000	1,826,463	Portugal. . . .	75,030	..
ance	241,778	3,798	Netherlands . .	63,260	341,618
uth Africa . .	183,005	22,862	Argentina . . .	50,825	4,515
ɔeden	161,489	28,716	Italy	43,935	15,719
pan	98,477	86,291	British India . .	42,543	50,956
itzerland . .	90,320	87,055	Norway	33,405	10,953

Eleven months.

As regards the gold fleeing from Germany's long reach, only t of this gold came directly to the United States from the ıntry of ownership. Much of it had been kept under earmark London and Paris and appears in the import totals from the ited Kingdom and France. Canada was, indeed, the country the western hemisphere which most of the European gold first ched in its journey to the United States. The usual practice s to send the metal by convoy from British ports to Canada. e important exception to this rule was to be found in the case the $241,778,000 of gold reported in the foregoing table as ring arrived from France. All of this gold arrived in June and of it was brought over by a United States warship. In a cedent breaking move, the United States bought this gold in ınce to keep it from falling into Germany's possession and, re being no other transportation available, brought the gold ne in a cruiser stationed in European waters.

This mountainous movement of gold from Europe to the United tes stripped Europe more nearly bare of gold than it had been modern times. Therein lay one explanation for the breakdown the foreign exchanges. The other explanation was to be found the measures adopted by the United States treasury following rmany's overrunning of Denmark, Norway, the Netherlands, lgium, Luxembourg, France and Rumania.

After the invasion of these nations by Germany, and of Latvia, huania and Estonia by soviet Russia, the United States treas- issued a regulation preventing, except by special licence, nsfers of property in this country standing to the credit of izens of the invaded nations. This move was made to ensure ınst the rightful owners losing their property under duress. e effect of the action was to immobilize upward of $3,000,000,- of funds and bring on the suspension of transactions in the rencies of the invaded nations.

In this way the United States, for reasons of public policy, orived an undetermined amount of gold of its utility. Some d held in the United States was, in common language, "frozen." her gold left in the invaded countries was not denied admission the United States, but the proceeds of the gold were promptly ought under the regulation, if it could be determined that the int of origin of the gold shipment was an invaded nation.

In this way, the United States introduced a new form of dis- mination against gold. Gold had been refused in the past ıong gold standard nations only because further growth in a tional gold reserve would be conducive to inflation. In this se, however, gold was in effect robbed of its utility temporarily cause the United States declined to recognize it, along with rious other forms of dollar assets, as an eligible spoil of war.

The increase in the production of gold was in no small measure ributable to the war. The British empire, as producer of re than half of the newly mined gold in the world outside of viet Russia, took steps to stimulate the mining of gold so as build up its store of foreign exchange. In 1939 estimated world production of gold outside of the U.S.S.R. was $1,206,000,- 000, or at a monthly rate of $100,510,000. In the first nine months of 1940 production of gold averaged approximately $106,- 000,000 a month, with the output in South Africa, Rhodesia, West Africa and Canada rising to new high levels. Production of gold in the Belgian Congo was more than doubled to aid in the cause of providing Britain and its allies with more purchasing power abroad. Canadian production, which in 1933 and 1934 had been only about $100,000,000 a year, was raised beyond the $200,000,000 mark in 1940.

The increase in the output of gold, together with sales of the metal out of stabilization fund holdings, caused a rise in the acknowledged gold reserves of central banks and governments of the principal nations of the world to a total of $28,660,000,000 at the end of Oct. 1940, according to estimates of the board of governors of the federal reserve system. This total compared with one of $25,776,000,000 at the close of 1939 and represented a new record high. Of this $28,660,000,000 figure, the holdings of the United States accounted for $21,506,000,000 or 74%. (*See* also EXCHANGE CONTROL AND EXCHANGE RATES; FINANCIAL REVIEW; GOLD.) (E. H. Co.)

Gold Standard: *see* GOLD RESERVES AND GOLD STANDARD.

Golf. International competition, specifically the Walker and Curtis cup matches, biennial series in which teams of British and United States amateur men and women golfers compete, were cancelled by the war in Europe.

The United States Ryder cup team, a group of professionals selected in 1939 for the biennial matches with British professionals, had an opportunity to prove their superiority in at least one direction. The team had been considered more or less an honorary one when the war caused cancellation of the matches in Florida, Nov. 1939. Action was assured, however, when Gene Sarazen (who had not been selected for the team, the first time since the Ryder cup came into play) declared he could gather together a team of U.S. professionals capable of defeating the squad selected by the Professional Golfers Association of America.

Walter Hagen, captain of the Ryder cup squad, accepted the challenge, and a series of matches was played in Detroit, Mich. The Hagen team was victorious and the proceeds helped materially in realizing the $50,000 which the Professional Golfers association turned over to the American Red Cross during 1940.

The only golf activity in Europe consisted of exhibition play by prominent players. Henry Cotton, most famous of England's contemporary linksmen, was reported to have raised £25,000 by his exhibition play.

In the United States the Open championship produced a surprise winner in W. Lawson Little. Twice winner of the British and twice winner of the United States Amateur championships, Little was not even considered among pre-tournament favourites. Little had enjoyed only spasmodic success since joining the professional fraternity in 1937.

Little, incidentally, won the United States Open title in a replay with Gene Sarazen, former United States and British Open victor, whose belated rush almost brought him a third U.S. Open title 18 years after he had won the honour for the first time.

The Open tournament was enlivened by the disqualification of Ed. Oliver, a neophyte professional, playing in the tournament for the first time. Among the first and second round leaders, Oliver, accompanied by John Bulla and E. J. Harrison, started his fourth round before the time prescribed by United States Golf association officials.

The threesome's transgression was discovered before the players had an opportunity to leave the starting tee, but inasmuch as all

three had driven off before the appointed time the United States Golf association wielded its legalistic power and ordered disqualification for the trio. Oliver, however, went on to complete the final 18 holes of the 72 holes championship and scored a 71, which gave him a four-round total of 287. Little already had completed his final round for 287, and later Sarazen came in with a like total.

Both Little and Sarazen petitioned the United States Golf association to permit Oliver to engage in the replay, but officials declared Oliver had not posted a 287 total, inasmuch as he was disqualified before starting the final 18 holes, thus the final round score could not be counted. Little, however, defeated Sarazen rather easily in the playoff.

The disappointments of the tournament were Sam Snead (whose game fell apart on the final round for the second time in two years), Jimmy Demaret and Ben Hogan.

Demaret and Hogan, natives of Texas, had been the sensations of winter tournament golf in the U.S. Demaret had won six Open tournaments, including the Bobby Jones Masters tournament and the Western championship. Hogan, who had been close to victory for several seasons, finally broke through and won three consecutive events with phenomenal scores.

Thus, Hogan and Demaret entered the United States Open championship as co-favourites with Snead. Hogan played well, but not close to expectations, and Demaret, after a discouraging first round, withdrew from the tournament during the second round. Hogan, however, went on to become first among prize winners for 1940, gathering in more than $10,000 in tournament winnings.

Byron Nelson, 1939 Open champion and runner-up in the National P.G.A. championship to Henry Picard, defeated Snead 1 up in a 36-hole final of the 1940 P.G.A. championship at Hershey, Pa. Nelson scored birdies on two of the last three holes to keep Snead from winning his first major title. Nelson also capped a successful 1940 season by winning first prize of $2,500 in the Miami (Fla.) Open tournament in December.

Marvin (Bud) Ward of Spokane, Wash., failed to defend successfully his United States Amateur championship at the Winged Foot club, Mamaroneck, N.Y. Ward was defeated in a quarter-finals match by Raymond Billows of Poughkeepsie, N.Y., the player he defeated so soundly in the 1939 finals.

Richard Chapman of Winged Foot, who had played so well in the British Amateur on several occasions, came through to win the U.S. title by defeating W. B. McCullough of Philadelphia, Pa., a "week-end" golfer, 11 and 9 in the finals.

Chapman played sensationally throughout the week, opening his challenge by winning the qualifying medal and coming from behind to overcome a 5 down deficit and defeat Wilford Wehrle, one of the favourites.

Miss Betty Jameson of Texas cemented her niche in women's golf when she successfully defended the United States amateur championship for women. The Texas girl won as convincingly in California as she did the previous year in Connecticut. In winning the title for the second time Miss Jameson defeated Miss Jane Cothran, a South Carolina girl, 6 and 5.

Miss Patty Berg, whose convalescence from an appendectomy prevented her from defending the title in 1939, made herself ineligible for the 1940 championship by accepting an employment offer from a golf equipment manufacturer and thus automatically becoming a professional.

The outstanding performance of the year by any golfer was Craig Wood's 264 for 72 holes in winning the Metropolitan Open championship. The tournament was played at the Forest Hill Field club, N.J., a par 70 course which is on the short side. Three years earlier the Metropolitan Open was played over the same course and was won by Jimmy Hines with a score of 279.

Wood opened with a six-under-par 64, added a 66, scored a th round 68 and then finished with a 66 for a mark of even This broke the existing record for the Metropolitan Open by strokes. Ben Hogan, whose 275 was three strokes better than previous record, finished second, 11 strokes behind Wood.

The only international "incident" of the year was the disqu fication of Jim Ferrier, Australian, from eligibility for the Uni States Amateur championship. Ferrier was barred from partici tion in the tournament because he had compiled a book wh the United States Golf association regarded as "instructional, violation of the amateur code.

Alarmed by the manner in which tournament golfers were p ting "backspin" on the ball, the United States Golf associati adopted a set of specifications to which manufacturers w directed to conform. The specifications prescribed standard de and width of markings on the faces of iron clubs. Although ma facturers were requested to conform to specifications in all i clubs manufactured on and after Jan. 1, 1941, the rule will become operative until Jan. 1, 1942. (T. Hu.

Goma y Tomas, Isidro (1869–1940), Spanish cardi was born in La Ribe, Spain, A 17 and was educated at the Metropolitan seminary of Tarrago He was ordained in 1895 and after serving as a parish priest came professor of profane and ecclesiastical science at the se nary, where he taught for 25 years. He was named bishop Tarazona in 1927 and archbishop of Toledo in 1931. In 1935 was made a cardinal by Pope Pius XI. He died in Madrid, A 22.

Goncourt Prize Novel: *see* Literary Prizes: *France.*
Gonorrhoea: *see* Venereal Diseases.

Goodrich, James Putnam (1864–1940), U.S. state g ernor, was born near W chester, Ind., Feb. 18, and was educated at DePauw universi Admitted to the bar in 1886, he practised in Winchester and In anapolis. He was chairman of the Republican State committee ten years and for eight years was a member of the executive co mittee of the Republican National committee. He was govern of Indiana from 1917 to 1921. He died in Winchester, Aug.

Göring, Hermann Wilhelm: *see* Goering, Hermann W helm.

Gort, John Standish Surtees Prendergast Vereker, 6th Viscount (1886-), British soldier, was b in July 1886, son of the 5th viscount, whom he s ceeded in 1902. He was educated at Harrow and Sandhurst, a joined the Grenadier guards as second lieutenant in 1905. In 19 he was appointed aide-de-camp to the general officer commandi the London district, and at the start of the World War in 19 he was in the first contingent that went to France. He serv throughout the war, sometimes on the staff and then on regimen duty; he was wounded four times, mentioned in dispatches ni times, and received the Victoria cross, the Military cross, and t Distinguished Service Order with two bars. After teaching in t army staff college and the senior officers' school, he went Shanghai as general staff officer. In 1930 he was appointed co mander of the Grenadier guards, and from 1932 to 1936 he was India as director of military training. He had been promoted major general in Nov. 1935, and in Sept. 1937 he was appoint military secretary to the secretary of state for war, with t

al rank of lieutenant general. On Dec. 2, 1937 he was named ef of the British Imperial general staff and on Sept. 3, 1939 mmander-in-chief of the British expeditionary forces to France. Viscount Gort remained in France until the evacuation of Dun- was almost completed, then returned to London June 1, 1940 the order of the government. King George commended him for manner in which he had conducted the Flanders retreat and withdrawal from Dunkirk and decorated him with the insignia a Knight of the Grand Cross of the Order of the Bath. On y 19, 1940 he was named inspector general of training forces.

vernment Departments and Bureaus.

The following are the leading officers of the more important vernment departments and bureaus of the United States. e date for the information is Jan. 1941.

Department or Bureau	*Name*	*Post*
artment of State	Hull, Cordell	Secretary
	Welles, Sumner	Under-Sec'y
artment of the Treasury	Morgenthau, Henry, Jr.	Secretary
	Bell, Daniel W.	Under-Sec'y
omptroller of the Currency	Delano, Preston	Comptroller
reasurer of the U. S.	Julian, William A.	Treasurer
ureau of Customs	Johnson, W. R.	Commissioner
ureau of Internal Revenue	Helvering, Guy T.	Commissioner
he Coast Guard	Waesche, Russell R., Rear Adm.	Commandant
Department	Stimson, Henry L.	Secretary
	Patterson, Robert P.	Under-Sec'y
hief of Staff	Marshall, George C., Gen.	Chief of Staff
djutant General	Adams, E. S., Maj. Gen.	Adj. General
hief of Engineers	Schley, J. L., Maj. Gen.	Chief
hief of the Air Corps	Arnold, H. H., Maj. Gen.	Chief
artment of Justice	Jackson, Robert H.	Att'y-Gen.
olicitor General	Biddle, Francis J.	Solic. Gen.
ederal Bureau of Investigation	Hoover, J. Edgar	Director
ureau of Prisons	Bennett, James V.	Director
nmigration and Naturalization Service	(Vacancy)	Commissioner
st Office Department	Walker, Frank C.	Post. Gen.
artment of the Navy	Knox, Frank	Secretary
ffice of Naval Operations	Stark, H. R., Adm.	Chief
ureau of Navigation	Nimitz, C. W., Rear Adm.	Chief
eneral Board	Sexton, W. R., Rear Adm.	Chairman
Iarine Corps	Holcomb, Thomas, Maj. Gen.	Commandant
artment of the Interior	Ickes, Harold L.	Secretary
	Wirtz, Alvin J.	Under-Sec'y
eneral Land Office	Johnson, Fred W.	Commissioner
ffice of Indian Affairs	Collier, John	Commissioner
eological Survey	Mendenhall, W. C.	Director
ish and Wildlife Service	Gabrielson, Ira N.	Director
ureau of Reclamation	Page, John C.	Commissioner
ational Park Service	Drury, Newton B.	Director
ureau of Mines	Sayers, R. R.	Director
artment of Agriculture	Wickard, Claude R.	Secretary
	Appleby, Paul H.	Under-Sec'y
gricultural Adjustment Administration	Evans, R. M.	Administrator
ureau of Agricultural Chemistry and Engineering	Knight, Henry G.	Chief
ureau of Agricultural Economics	Tolley, Howard R.	Chief
ureau of Animal Industry	Mohler, John R.	Chief
ommodity Credit Corporation	Robbins, Carl B.	President
ureau of Entomology and Plant Quarantine	Strong, Lee A.	Chief
arm Credit Administration	Black, Albert G.	Governor
orest Service	Clapp, Earle H.	Acting Chief
ureau of Home Economics	Stanley, Louise	Chief
ureau of Plant Industry	Auchter, E. C.	Chief
ural Electrification Administration	Slattery, Harry	Administrator
oil Conservation Service	Bennett, Hugh H.	Chief
artment of Commerce	Jones, Jesse H.	Secretary
	Taylor, Wayne C.	Under-Sec'y
ureau of the Census	Austin, William L.	Director
ureau of Foreign and Domestic Commerce	Wilson, Carroll L.	Acting Director
ational Bureau of Standards	Briggs, Lyman J.	Director
oast and Geodetic Survey	Colbert, Leo O.	Director
ivil Aeronautics Board	Branch, Harllee	Chairman
ureau of Marine Inspection and Navigation	Field, R. S.	Director
atent Office	Coe, Conway P.	Commissioner
eather Bureau	Reichelderfer, F. W.	Chief
artment of Labor	Perkins, Frances	Secretary
	McLaughlin, C. V.	Asst. Sec'y
nited States Conciliation Service	Steelman, J. R.	Director
ureau of Labor Statistics	Lubin, Isador	Commissioner
Children's Bureau	Lenroot, Katharine F.	Chief
Women's Bureau	Anderson, Mary	Chief
Wage and Hour Division	Fleming, Philip B., Col.	Administrator
Independent Offices		
*Civil Service Commission, U. S.	Mitchell, Harry B.	President
Interstate Commerce Commission	Eastman, Joseph B.	Chairman
*Federal Reserve System, Board of Governors	Eccles, Marriner S.	Chairman
Federal Trade Commission	March, Charles H.	Chairman
United States Tariff Commission	Stevens, Raymond B.	Chairman
United States Board of Tax Appeals	Arundell, C. R.	Chairman
Federal Power Commission	Olds, Leland	Chairman
*Veterans' Administration	Hines, F. T., Brig. Gen.	Administrator
*Smithsonian Institution	Abbot, C. G.	Secretary
*Pan-American Union	Rowe, L. S.	Director Gen.
*American National Red Cross	Davis, Norman H.	Chairman
*Tennessee Valley Authority	Morgan, Harcourt A.	Chairman
Federal Deposit Insurance Corporation	Crowley, Leo T.	Chairman
Securities and Exchange Commission	Frank, Jerome N.	Chairman
The National Archives	Connor, R. D. W.	Archivist
National Labor Relations Board	Millis, Harry Alvin	Chairman
Federal Communications Commission	Fly, James L.	Chairman
*Government Printing Office	Giegengack, A. E.	Public Printer
United States Maritime Commission	Land, E. S., Rear Adm.	Chairman
Maritime Labor Board	Bruere, Robert W.	Chairman
Federal Security Agency	McNutt, Paul V.	Administrator
Civilian Conservation Corps	McEntee, J. J.	Director
National Youth Administration	Williams, Aubrey	Administrator
Office of Education	Studebaker, John W.	Commissioner
*Public Health Service	Parran, Thomas	Surgeon Gen.
Social Security Board	Altmeyer, Arthur J.	Chairman
Food and Drug Administration	Campbell, W. G.	Commissioner
Federal Works Agency	Carmody, John M.	Administrator
Public Buildings Administration	Reynolds, W. E.	Commissioner
Public Roads Administration	MacDonald, Thomas H.	Commissioner
Public Works Administration	Gilmore, M. E., Col.	Commissioner
U. S. Housing Authority	Straus, Nathan	Administrator
*Work Projects Administration	Hunter, Howard O.	Acting Commissioner
Federal Loan Agency	Jones, Jesse H.	Administrator
*Export-Import Bank of Washington	Moore, R. Walton	Chairman
*Federal Home Loan Bank Board	Fahey, John H.	Chairman
Home Owners' Loan Corporation	Jones, Charles A.	Gen. Mgr.
Federal Housing Administration	Ferguson, A. H.	Administrator
*Reconstruction Finance Corporation	Schram, Emil	Chairman
Executive Office of the President		
Bureau of the Budget	Smith, Harold D.	Director
National Resources Planning Board	Delano, Frederic A.	Chairman
Office of Government Reports	Mellett, Lowell	Director
Office of Production Management for Defence	William S. Knudsen	Director General
	Sidney Hillman	Assoc. Dir. Gen.

*See separate article.

Great Britain.—The following were the ministers and chief permanent officials of the more important of the government departments of Great Britain at the close of 1940:

Ministry or Department	*Name*	*Post*
Admiralty, The Board of	A. V. Alexander	First Lord
	H. V. Markham	Permanent Secretary
Agriculture and Fisheries	R. S. Hudson	Minister
	Sir Donald Fergusson	Permanent Secretary
Aircraft Production	Lord Beaverbrook	Minister
	A. Rowlands	Permanent Secretary
Air Ministry	Sir Archibald Sinclair	Secretary of State
	Sir Arthur Street	Perm'nt Under-sec'y
Burma Office	L. S. Amery	Secretary of State
	D. T. Monteith	Deputy Under-Sec'y of State (Acting)
Cabinet Office	Sir Edward Bridges	Secretary
Civil Service Commission	A. P. Waterfield	1st Commissioner
Colonial Office	Lord Lloyd	Secretary of State
	Sir Cosmo Parkinson	Perm'nt Under-sec'y
Commissioners of Crown Lands	The Minister of Agriculture and Fisheries (*ex-officio*)	Commissioner
	C. L. Stocks	Perm'nt Commissioner
Crown Agents for the Colonies	Sir W. Cecil Bottomley	
	H. C. Thornton	
Customs and Excise, Board of	Sir G. Evelyn P. Murray	Chairman
Dominions Office	Lord Cranborne	Secretary of State
	Sir Eric Machtig	Perm'nt Under-sec'y (Deputy)

Ministry or Department	*Name*	*Post*
Duchy of Lancaster	Lord Hankey	Chancellor
	Sir John Bennett	Vice-chancellor
Economic Warfare, Ministry of	Hugh Dalton	Minister
	Sir Frederick Leith-Ross	Director-General
Education, Board of	Herwald Ramsbotham	President
	Sir Maurice Holmes	Permanent Secretary
Food, Ministry of	Lord Woolton	Minister
	Sir Henry L. French	Secretary
Foreign Office	Anthony Eden	Secretary of State
	Sir Robert Vansittart	Chief Diplomatic Adviser
	Sir Alexander Cadogan	Perm'nt Under-sec'y
Health, Ministry of	Malcolm MacDonald	Minister
	Sir John Maude	Secretary
Home Office and Ministry of Home Security	Herbert Morrison	Secretary of State
	Sir A. Maxwell	Perm'nt Under-sec'y Home Office
	Sir G. Gater	Secretary, Ministry of Home Security
India Office	L. S. Amery	Secretary of State
	Sir Stuart Kelson Brown	Acting Perm'nt Under-sec'y
Information, Ministry of	A. Duff Cooper	Minister
	Sir Walter Monckton	Director-General
Inland Revenue, Board of	Sir Gerald B. Canny	Chairman
Labour and National Service, Ministry of	Ernest Bevin	Minister
	Sir T. W. Phillips	Secretary
Lord Privy Seal	C. R. Attlee	Lord Privy Seal
Mines, Ministry of	D. R. Grenfell	Minister
	Sir Alfred Hurst	Permanent Secretary
Patent Office	M. F. Lindley	Comptroller-general
Paymaster-General's Office	Earl Winterton	Paymaster-general
	L. Cuthbertson	Asst. Paymaster-gen.
Pensions, Ministry of	Sir Walter Womersley	Minister
	Sir Adair Hore	Permanent Secretary
Petroleum, Ministry of	Geoffrey Lloyd	Secretary
	Sir Alfred Faulkner	Perm'nt Under-sec'y
Post Office	W. S. Morrison	Postmaster-general
	Sir Thomas Gardiner	Director-general
Privy Council Office	Sir John Anderson	Lord President
	Sir Rupert B. Howorth	Clerk of the Council
Public Record Office	The Master of the Rolls	Keeper of the Records
	C. T. Flower	Deputy Keeper
Public Trustee Office	Sir Ernest Fass	Public Trustee
Scottish Office	Ernest Brown	Secretary of State
	Sir Horace P. Hamilton	Under-sec'y of State
Shipping, Ministry of	R. H. Cross	Minister
	Sir Cyril Hurcomb	Director-General
Stationery Office, H.M.	Sir William R. Codling	Controller
Supply, Ministry of	Sir Andrew Duncan	Minister
	Sir William Brown	Permanent Secretary
Trade, Board of	Oliver Lyttleton	President
	Sir William Brown	Permanent Secretary (seconded to Ministry of Supply)
	Sir Arnold Overton	Second Secretary
Transport, Ministry of	Col. J. T. C. Moore-Brabazon	Minister
	Sir Leonard Browett	Permanent Secretary
Treasury	Winston Churchill	Prime Minister and First Lord
	Sir Kingsley Wood	Chancellor of the Exchequer
	Sir Horace Wilson	Permanent Secretary and Head of H.M. Civil Service
War Office	Capt. David Margesson	Secretary of State
	Sir James Grigg	Perm'nt Under-sec'y
Works and Public Buildings	Lord Reith	Minister
	Sir Patrick Duff	Secretary

Government Expenditures: *see* BUDGETS, NATIONAL; TAXATION.

Government Printing Office. The office was established by authority of congress in 1860 to execute printing and binding for the executive and judicial departments and the court of claims. Its functions extend to all branches of the government and include the sale of official publications, reports and technical bulletins. Many of its publications are printed in foreign languages and find circulation in other countries. The total area occupied by the government printing office in 1940 was 1,396,973 sq.ft. or 33 acres. The value of the buildings was $9,634,825; machinery and equipment $5,865,933, making the total value of the plant $15,500,758. At the end of the fiscal year 1940 there were 6,059 employees on the rolls with a pay roll of approximately $12,963,771. T office produced a total of 155,046,098 publications of all class This total included 7,876,562 copies of the *Congressional Reco* 5,815,470 copies of specifications of patents, trademarks, desig etc.; and 241,432 copies of the *Official Patent Office Gaze* and annual indexes. Postal cards delivered amounted to 2,26 136,000; money orders delivered, 267,767,825; and the sto division handled approximately 2,735 carloads of paper. Dur the fiscal year 1940 the division of public documents mailed 702,160,053 publications and forms; its receipts from the s of government publications during the year amounted to $1,11 050.54. The total value of all printing done was $20,085,183. (A. E. GI.)

Governors and Premiers, British: *see* BRITISH EMPIRE
Grain: *see* BARLEY; CEREALS; CORN; OATS; RICE; RYE; WHE
Grand Coulee Dam: *see* DAMS; ELECTRIC TRANSMISSION A DISTRIBUTION; PUBLIC UTILITIES.
Granite: *see* MARBLE AND GRANITE.

Grapefruit. Production of grapefruit in the United States the 1940–41 season was estimated by the de partment of agriculture as 40,364,000 boxes, compared w 34,975,000 in 1939–40 and 43,594,000 in 1938–39. Florida cro increased 32% and Texas 6% while in California and Arizo combined the 1940–41 production was about 10% below t preceding season. Production by states in 1940, in 1939 and the ten-year (1929–38) average is shown in Table I.

Table I.—*Grapefruit Production by States, 1940, 1939 and 10-Year Aver*

	1940 Boxes*	1939 Boxes*	1929–38 Boxes*
Florida			
All varieties	21,000,000	15,900,000	14,037,000
Seedless	7,200,000	6,500,000	†5,033,000
Other varieties	13,800,000	9,400,000	†10,533,000
Texas	15,000,000	14,200,000	5,029,000
Arizona	2,570,000	2,900,000	1,252,000
California	1,794,000	1,975,000	1,640,000

* Net content of boxes in California and Arizona averages approximately 60 lb. Florida and Texas, 80 lb. † Short time average.

War severely damaged the new grapefruit industry of Palesti which had become an important competitor for European ma kets. Shipments of grapefruit from Palestine from Nov. 19 to June 1940 were 987,000 boxes compared with 2,067,000 box the preceding season. Lack of shipping facilities and mark closed by blockade caused the decline.

Table II.—*Grapefruit Production in Certain Countries, 1940-41 and 1939-*

	1940–41 Boxes	1939–40 Boxes
Jamaica	190,000	185,000
British Honduras	100,000	125,000
Honduras	90,000	80,000
Cuba	225,000	200,000

Relief loans, subject to government guarantees, to grapefr growers were authorized to be advanced by the four princip banks in Palestine to a maximum of about $2,000,000, or estimated $32 per acre. Table II shows other commercial pr duction in the 1940–41 and the 1939–40 seasons as reported the Office of Foreign Agricultural Relations, United States d partment of agriculture. (S. O. R.)

Grapes. Production of grapes in the U.S. in 1940 was es mated Nov. 1 by the department of agriculture 2,577,110 tons. The 1939 crop was 2,525,830 tons, and the te year (1929–38) average 2,220,001 tons. Raisin-type grapes 1940 were estimated at 1,249,000 tons as against 1,269,000 to in 1939 and a ten-year average of 1,126,500 tons. In Califor

Production of Grapes by States, 1940 and 1939

State	1940 tons	1939 tons	State	1940 tons	1939 tons
lifornia	2,281,000	2,228,000	Georgia	2,080	1,830
w York	75,800	75,600	South Carolina	1,990	2,020
chigan	56,900	58,100	West Virginia	1,910	1,750
io	37,500	42,800	Tennessee	1,780	2,240
nnsylvania	23,000	23,200	Alabama	1,380	1,710
ssouri	10,900	12,500	New Mexico	1,270	1,170
kansas	9,600	8,200	Utah	860	840
rth Carolina	8,500	7,500	Florida	830	670
nois	8,100	8,800	Massachusetts	780	700
shington	6,500	5,700	Colorado	770	500
va	6,300	5,800	Arizona	740	710
nsas	4,600	4,100	Maryland	720	750
liana	4,000	4,800	Idaho	580	580
w Jersey	3,900	3,100	Wisconsin	490	490
braska	3,800	3,000	Minnesota	300	290
lahoma	3,600	3,200	Rhode Island	280	230
xas	3,000	2,800	Mississippi	220	290
ginia	2,800	2,600	New Hampshire	120	110
ntucky	2,790	2,750	Nevada	110	110
nnecticut	2,770	2,460	Louisiana	60	50
egon	2,300	1,700	Vermont	50	50
laware	2,100	2,000	Maine	30	30

1940 estimate for wine grapes was 608,000 tons compared to ,000 tons in 1939 and a ten-year average of 481,800 tons. ole grapes in California were estimated at 424,000 tons com- ed to 390,000 tons in 1939 and a ten-year average of 342,400 s. About 10% of the Concords, the principal variety in New k, were damaged by hard freezes Oct. 19 and 20 in the utauqua-Erie belt, and about 80% of the minor Catawba iety in the Finger Lakes region. The table shows production grapes by states in 1940 and 1939. (S. O. R.)

iphite. Exports of graphite from Chosen in 1939 increased 14% over 1938, to 57,700 metric tons; Mexico in stood at 8,200 tons, while Ceylon rose to a record figure 22,800 tons; figures are lacking for Madagascar (13,400 tons 938) and for Germany, but on the basis of past outputs, in- ling Austria and Czechoslovakia, that country has a potential put of 45,000–50,000 tons. Producers of less importance in- le Canada, India, Italy, Japan and Norway. Production in the ted States almost ceased. It is important to note that with the exation of Austria and Czechoslovakia, Germany became at same time the largest producer of graphite and the only sumer of importance with a surplus supply from domestic rces; all other consuming countries are dependent on imports most or all of their supply of graphite. (G. A. Ro.)

avel: *see* SAND AND GRAVEL.

ives, William Sidney (1865–1940), U.S. major general, was born in Mt. Calm, as, March 27. He was graduated from the United States itary academy in 1889 and rose through various grades to rank of major general on July 11, 1925. He served in the lippines in the early days of the U.S. occupation. In 1918 he put in command of the American expeditionary force in eria and for two years was in command of the American base Vladivostok. He received the Distinguished Service medal n congress and was decorated by Japan, China, Czechoslovakia Italy. He died in Shrewsbury, N.J., Feb. 27.

aziani, Rodolfo, MARCHESE DI NEGHELLI (1882–), Italian soldier, was born Aug. 11 at ettino. Selecting the army for his career, he served in Eritrea n 1908 to 1913 and in Libya prior to Italy's entry into the rld War of 1914–18. In the campaigns against Austria he was mander of an infantry brigade and by Oct. 1918 had advanced olonel. Afterward he commanded a brigade in Macedonia and ing his service in Tripolitania (1921–29) was promoted to eral of a division. From 1930 to 1934 he commanded the ian forces in Libya and in 1935 and 1936 he directed the southern attack against Haile Selassie's forces in Abyssinia. He became known as Italy's greatest colonial soldier and second in fame only to Marshal Badoglio (*q.v.*).

Upon Italy's declaration of war June 10, 1940, Graziani was confirmed as chief of the army staff. After the death of Italo Balbo (*q.v.*) he was appointed governor general of Libya. As commander of Italy's North African forces he directed the Italian invasion of Egypt which began Sept. 12. After capturing Sidi Barrani Sept. 16 Graziani's offensive bogged down; it was thrown into full reverse by the British drive launched Dec. 9. In a report to Mussolini on Dec. 22 Graziani attributed the Italian defeat to lack of adequate mechanized equipment.

Great Britain & Northern Ireland, United Kingdom of.

This comprises the main island of Great Britain, with numerous smaller islands off the English and Scottish coasts, and the six north-eastern counties of Ireland. It is a constitutional monarchy, with a king and a parliament of two houses, the house of lords consisting of about 670 hereditary peers, 24 spiritual peers, 16 Scottish representative peers, a number of Irish representative peers (in 1940, 14; vacancies are no longer filled) and a few life peers who have held high judicial office; and house of commons, numbering 615 members, elected by a practically universal suffrage. Flag, the Union Jack, consisting of a red cross on a white field (for England), surcharged on a diagonal red cross on a white field (for Ireland), surcharged in turn on a diagonal white cross on a blue field (for Scotland). Ruler: King George VI; premier: Rt. Hon. Winston S. Churchill, C.H.; religion: chiefly Protestant Episcopal Church.

Area and Population.—Area 93,991 sq.mi.; pop. (est. June 30, 1939) 47,680,500 (England and Wales 41,375,000). Chief towns (pop. est. June 30, 1938): London (cap.), city and metropolitan police districts, 8,700,000; city and metropolitan boroughs only, 4,062,800; Glasgow (June 30, 1939), 1,131,500; Birmingham, 1,041,000; Manchester (including Salford), 932,300; Liverpool, 827,400; Sheffield, 520,000; Leeds, 494,000; Edinburgh (June 30, 1939), 473,200; Belfast (Jan. 1, 1939), 443,500; Bristol, 415,000; Hull, 318,700.

History.—The history of the United Kingdom during the year 1940 is neither more nor less than the history of its war experience —not exactly the history of the war itself, which is told in greater detail in other articles, but the history of the impact of the war, phase by phase, on the history of the governments and peoples at home. That history may be regarded from several different angles. One may regard it as a crescendo of urgency and effort, with a sudden jerk forward on May 10, when two decisive events occurred simultaneously but independently of one another, the German invasion of Holland and Belgium and Winston Churchill's accession to office as prime minister. One may regard it as a descent, punctuated by a series of reverses of increasing magnitude, into the gulf of peril, followed by an emergence, not out of peril perhaps but into full confidence based on brilliant achievement. Lastly, one may regard it as a series of phases, each peculiarly distinct, sometimes following directly upon one another, sometimes separated by pauses, but hardly at all overlapping. The first phase, begun in Nov. 1939, was one in which the main preoccupation was a war in which the British were not technically engaged at all, the attack of Russia on Finland. It ended with the Russo-Finnish peace treaty of March 12, 1940. Four weeks passed, and the second phase opened with the German assault on the two northern neutral states of Denmark and Norway on April 9. This phase ended in essentials with the withdrawal of British and French troops from the

INTEREST RATHER THAN FEAR is exhibited by these English children who took shelter in a ditch during a German air raid of 1940

neighbourhood of Trondhjem in the first week of May. The third phase opened on May 10 with the German invasion of Holland and Belgium and ended with the withdrawal of the greater part of the British expeditionary force from Dunkirk in the f four days of June. The fourth phase opened on June 5 with German attack on the French armies from Abbeville to the no ern end of the Maginot line and ended on June 16–17 with fall of M. Reynaud's French government and the capitulatio France. During this phase Italy had joined Germany and its saw Britain standing virtually alone. The fifth phase, the called battle of Britain, did not enter an acute stage until large-scale German air raids began on Aug. 8, the 22nd anni sary of what Ludendorff had called "the black day of the war Germany," the British attack in front of Amiens on Aug. 8, 1 This culminated in the tremendous air battle of Sept. 15 du which, it is said, an oversea invasion was actually launched. long series of aimlessly destructive night bombings followed constituted a sixth phase. This continued to the end of the y and both fifth and sixth phases were, of course, coincident in t with British bombing of every kind of genuine military objec in enemy-occupied territory. The seventh and last phase ope with the abortive Italian attack on Greece at the end of Octo intensified by the brilliant British assault on the Italian arm Libya, which began on Dec. 9.

These seven phases will be reviewed in turn, but it will be venient first to mention certain incidents which do not fall wi any of them. The chief occupation of the German air forc the first eight months of the war, the period of sitzkrieg, or s warfare, was to attack British and neutral shipping, either rectly or by laying mines. The counteractivity of the Br air force was to watch over the enemy seaplane bases, an attack the enemy as they sallied forth. For a long time th forces of both sides were under instructions to refrain f dropping bombs on enemy territory. But on Jan. 9–10 the ish bombed the enemy seaplane base at Sylt, just south of Danish frontier, and on March 19–20, three days after a Ger air raid on Scapa Flow which entailed the first British civ casualties, the British air force subjected Sylt to a much hea bombardment lasting six hours.

On Jan. 16 the admiralty announced the loss of three marines, the first sunk by enemy action during the war. On 17 the German vessel "Altmark," with over 300 seamen on b from vessels sunk by the "Graf Spee" (destroyed off Montev in the previous December), was boarded and captured after h to-hand fighting by the British destroyer "Cossack." This dent took place in a Norwegian fjord, and led to a protest the Norwegian government against a breach of her neutral ri The effective answer was given that Norway had herself negle her duty as a neutral by allowing the "Altmark" to proceed w out examination through her territorial waters.

On Jan. 8 rationing for bacon and ham, butter and sugar, d into force, followed by meat rationing on March 11. The rat supplemented by unrationed foods, allow an ample diet, an can be said without exaggeration that the handling of coupo the only hardship involved.

The Problem of Finland.—British opinion recognized, al without exception, that Finland, in her heroic resistance to sian aggression, was morally an ally in that her cause was defence of freedom, but the problem of rendering her effe assistance was beset with difficulties. Whatever the British m think of Russia's action they were not anxious to add her to list of their active enemies; whatever help they might sen Finland must not be allowed to subtract seriously from their vital requirements for defence against an attack which m come at any moment; and further, whatever help the Br might, in spite of these considerations, decide to send would to get through two serious obstacles, the obstacle impose geography and the obstacle of Scandinavian neutrality. The

made known by the prime minister, Neville Chamberlain, ıe debate that followed the end of the Finnish resistance. ınd's requests for military equipment of all kinds were very ·ly met—on paper. But delays, avoidable and unavoidable, such that much, though released in Britain, did not reach ›ral Mannerheim in time for use. As regards direct support of ɔs, Mannerheim asked that 30,000 trained men should arrive ınland by May, and the British and French governments un- ɔok to fulfil this request and did in fact equip an expedition- force of these dimensions. But Finland was compelled to ulate before the opposition of Norway and Sweden to the sport of the force across their territories had been overcome. ɔuld be maintained that, under the covenant of the League Nations, Norway and Sweden were under an obligation to t Finland, passively if not actively, against what the league officially proclaimed to be aggression; but Hitler spoke louder the league. Whatever their duties or their sympathies they afraid to afford an excuse for a German invasion.

ıe Problem of Norway.—Americans were inclined to speak of war at this stage as a "phony" war. Sea warfare, indeed, was ıg much the same form as in 1914–18; but air warfare was ly limited to co-operation with sea warfare, and the warfare rmies on land, which to the layman always seems the main activity, was practically nonexistent. There remained eco- ic warfare, or blockade. Blockade had played a very large in the defeat of Germany in 1918, and it was hoped that in respect history would repeat itself. One of the commodities hich a decisive shortage might be created by blockade was Germany had an important source of external supply in the of northern Sweden, which travelled by rail to Narvik in hern Norway and thence down the "accursed corridor" of vegian territorial waters. After long hesitation the Allies on l 8 laid a minefield in these territorial waters which would ɔ ships out into the open sea and put them at the mercy of sh sea power. On the next day Germany occupied Denmark invaded Norway. There was a flimsy pretence that this was eply" to the Allied breach of Norwegian neutral rights, but ally the undertaking, which was based on typically elaborate well thought out plans, had not only been prepared long be- but had actually been set in motion the day before, not the after, the laying of the minefield. Norwegian treachery on a large scale co-operated by arrangement with the German in- rs. The main line of invasion was through Oslo, which was led over to the invaders almost without a blow, but the Atlan- ɔorts of Bergen and Trondhjem and Narvik and all the main dromes were seized by small forces smuggled into Norway in mercial vessels or by troops landed from troop-carrying planes.

he royal navy responded immediately with the two battles of vik on April 10 and 13. In the first of these battles four man destroyers and seven other vessels were destroyed by a h weaker British force—one of the most glorious achieve- ts in the records of the royal navy. But the decisive theatre much farther south. Could the Allies, taking into account the culties involved, their lack of Norwegian air bases, and the of depleting their forces elsewhere against an enemy still stronger than themselves in fighting power everywhere except ea, land at Trondhjem or elsewhere an expeditionary force cient to defeat the Germans and drive them out of Norway, in them down in some small corner of it? From April 15 on- d small Allied forces were landed at Andalsnes and Namsos, either side of Trondhjem, but the Germans advanced from ɔ in overwhelming force; British fighter planes could not, from r distant British bases, combat the German bombers; the sea air arm was insufficient for the purpose; and in the first week of May the British troops were withdrawn.

The Change of Government.—This failure was the occasion of the historic debate in the house of commons of May 7 and 8. Beginning as an attack on the conduct of the Norwegian operations it broadened out into an impeachment of the government for the whole of its conduct and attitude towards the war during the first eight months, in which many speakers outside the official "opposition" joined. A division was demanded in which 44 normal supporters of the government voted against it and many more refrained from voting. The government majority of 80 was morally a defeat; on May 10 Mr. Chamberlain resigned and Mr. Churchill became prime minister.

If the ground of the division had really been a conflict of opinion about the strategy pursued in Norway during the previous month, the accession to office of Mr. Churchill would have been quite illogical since, as first lord of the admiralty, he was as much responsible as any man for that strategy. But it was not so. Those who voted against the government did so because they held that it had proved its inadequacy all along the line, and there was no question that those who held this view regarded a really national "all-in" and "all-out-to-win" government under Mr. Churchill as the only satisfactory alternative. Mr. Churchill came into power with many assets in his favour. For one thing he had no association with Munich and the discredit and failure of the "appeasement" policy; from the first he had realized the

ɔVER CHURCH shelled in 1940 by German guns across the English channel

UNPERTURBED CITIZENS fished as usual in the Thames during the midsummer of 1940

menace of Hitler, and had pressed the claims of rearmament on a reluctant and incredulous parliament and people. Secondly, he was, apart from Lloyd George, now nearly 80 years old, the only living British statesman who was held to have proved himself a first rate war minister in 1914–18. Thirdly, and most important in these days of wireless, he had, like Hitler, and unlike Mr. Chamberlain, oratorical powers of the very highest order. And lastly, he secured, as Mr. Chamberlain had failed to do, the active co-operation within his government of all political parties. The Labour leaders, Mr. Attlee and Mr. Greenwood, joined Mr. Churchill as ministers without portfolio in his new war cabinet, and big men outside politics, Mr. Bevin, a trade union leader, and Lord Beaverbrook, a proprietor of popular newspapers, took two key posts as ministers of labour and of aircraft production. Nothing that happened in the ensuing eight months impaired the confidence with which Mr. Churchill's government was from the first regarded.

The Meuse and Dunkirk.—On May 10, the day Mr. Churchill took office, German armies invaded Holland and Belgium. The Dutch invasion was accompanied by pre-organized treason of civilian elements in Holland, many of them Germans who had entered the country during recent months, by the dropping of parachutists who seized aerodromes and took the Dutch armies in the rear, and by a ferocious air bombardment of Rotterdam. On May 14 the Dutch laid down their arms. In Belgium, German armies made their way through the Ardennes with remarkable speed and efficiency to the Meuse sector of the French frontier, which was defended by weak, inefficient and possibly treacherous French forces. Between May 16 and 20 they had broken right through with a powerful mechanized force, the French having made what the premier, Reynaud, described as "incredible mistakes." By May 26 the Germans were in occupation of Amiens and Boulogne. The British army of 365,000 men, together with part of the French army and the Belgian army, was entirely cut off from the main body of the French armies, and was being driven back upon a narrow strip of coast. On May 28 the king of the Belgians ordered his army to lay down its arms. It looked as if practically the whole of the British army might be compelled to surrender. Actually 330,000 men were safely evacuated, during the first four days of June, from the beaches of Dunkirk in "one of the most difficult operations of war ever undertaken." It was a triumph of co-operation between army, navy and air force. But the whole equipment of the B.E.F. had to be lef enemy hands.

During this crisis the force first known as the local defe volunteers and afterwards as the home guard was formed grew in the next few months to 1,500,000. At the same time enemy aliens were interned. Hitherto the British government pursued an extraordinarily generous and trustful policy towa such persons. But now no risks could be run. The policy wholesale internment, executed in haste, involved inevitable justice to individuals of proven loyalty; such injustices H since been in large measure remedied by a policy of what may called "retail" release. At the same time a number of Brit fascists and other possible "Quislings" (the name of a notor pro-German Norwegian) were imprisoned.

The Collapse of France.—On June 5, the day after the com tion of the evacuation at Dunkirk, the "battle of France" bega The Germans attacked all along the Somme and the Aisne, from the start the French armies as a whole offered only fe resistance. They were outclassed in every department. Italy clared war on June 10. Paris fell on June 14. The Reynaud g ernment was overthrown on June 16, and on June 17 the Pé government, violating the terms of the Anglo-French allia asked for peace terms. On June 18 General de Gaulle, Reyna military adviser, having arrived in London, issued his call Frenchmen to continue the fight for their country and emp The Franco-German armistice, involving terms of absolute render, was signed on June 22.

Comparatively small British forces had been engaged in "battle of France." They were evacuated, not without seri loss, from ports in the west of France. On June 28 the Cha islands were demilitarized and a considerable part of their po lation evacuated. The downfall of France appeared almost credible to the world in general, but less so to students of re French history. There had been for some years past a not unequal balance between the forces of patriotism and free and the forces of *défaitisme* and pro-Germanism in that coun

French reluctance at the outbreak of war had delayed Anglo-French ultimatums from Sept. 1 (the day of the inva of Poland) to Sept. 3. Still, so long as all seemed well, the fo of *défaitisme* were kept under and well out of sight. The sh of defeat tilted the balance in their favour and brought them the surface.

The defeat of France had a grim aftermath. The armis terms involved the surrender to German control of the whol the French navy. This could not be allowed, though the Bri government was prepared to accept any reasonable alterna such as the internment of French ships of war in Ameri waters. At Oran on the Algerian coast on July 3 the Fre admiral refused the conditions offered by the British governm whereupon a British squadron opened fire and destroyed or abled the greater part of this French fleet. Elsewhere Fre ships were either disabled, or interned by agreement, or vo tarily handed over to British control. But many destroyers minor craft passed into German hands.

The Battle of Britain.—If the "battle of Britain" had follo as closely on the "battle of France" as that had followed on "battle of Flanders" no surprise would have been felt. T was widespread raiding by small parties of German bombers all parts of Great Britain in the last fortnight of June throughout July, but these could be regarded as no more practice flights and rehearsals. Hitler was said to have fixed date for the capitulation of Britain as Aug. 15, which in the C olic church is "the Feast of the Assumption," but for a long nothing happened to suggest any attempt to keep true to his ti table. At last on Aug. 8 German air raids *en masse* began.

rfare lends itself more to statistical treatment than other ms of warfare, and statistics will be found elsewhere in this ume. On the heaviest day of the August fighting, the 15th, the rmans lost 180 machines, only surpassed by the air battle of ot. 15 when at least 185 German planes were brought down, and ording to an unofficial estimate, nearly 250. Throughout, the rmans lost more than three times as many machines and more n six times as many men as their opponents. But the main ult was not statistical. The Germans decisively failed to ieve mastery of the air by daylight raids over the British st. Thereafter Hitler abandoned, for 1940, all serious attempt conquer Britain by "air-blitz" and invasion, concentrating in-ad on night raids designed to destroy life and property. These most heavily on London, but also on a number of provincial ns such as Coventry, Southampton, Bristol, Birmingham, nchester and Liverpool. These raids tested severely the courage the people and the efficiency of the A.R.P. services but served military purpose. The casualties of civilians in the last four nths of the year were much heavier than those of all the tish fighting services in all theatres of war during the same iod. On one of the last nights of the year enemy bombers troyed by fire a number of the historic buildings of the City of ndon, including Guildhall. Meanwhile the R.A.F. were nightly aged in raids on military objectives ranging from the French ts to Berlin. (*See* also AIR FORCES.)

The Mediterranean.—The entry of Italy made the Mediterean likely to become a main theatre of war. The enemy might k, with or without Spanish co-operation, to secure control of raltar, and, at the other end, to attack the Suez canal through Balkan countries, or French Syria, left derelict by the colse of France. The Italian fleet was, until half of it was troyed by air attack in Taranto harbour on Nov. 11, much erior "on paper" to the British Mediterranean fleet, and nziani's army in Libya enjoyed a similar and more decisive eriority over Gen. Wavell's army in Egypt. But enemy ofsive in these regions seemed to hang fire except that Hitler re or less annexed Rumania (Oct.) with disastrous results that country.

However, on Oct. 28 Mussolini, with or without German apval, made an attack on Greece from Albania, which he had acherously occupied 18 months before. The result was, with exception, the greatest surprise of the war up to date. The ces of this so-called "great power," heirs of the Roman em-e, showed themselves inferior at all points to the Greeks, and the end of the year were being driven back on Valona, their in port of embarcation.

British assistance to the Greeks delayed the execution of their n plans in Libya until December. The attack was opened on c. 9, and two days later the Italian advanced base of Sidi rrani was enveloped and secured, with 30,000 prisoners and mense quantities of stores. The victory was the result of brilnt co-operation of army, navy and air force. By the end of year a similar fate seemed in store for Bardia, further west the same coast: it in fact fell on Jan. 5, 1941. No blow exot from the air had yet been struck at Germany, but her rtner was already badly mauled.

Shipping Losses.—In the latter months of the year shipping ses due to enemy action mounted in many weeks to unasantly high figures, though never approaching those of the rst months of 1917. The abandonment of the naval bases in stern Ireland, surrendered in 1938 as part of a futile effort to pease" de Valera, was deplored, but the exchange of 50 Ameri-n destroyers for the lease to America of naval bases in the est Indies and elsewhere did something to redress the balance. ly a really big increase in destroyer strength could give security to all convoys on all seas. (D. C. So.)

Education.—In 1937–38: elementary, England and Wales, departments under separate head teachers 29,988, scholars on register 5,150,874; elementary, Scotland—schools 2,895, scholars 617,047; elementary, Northern Ireland—schools 1,700, scholars 191,862; secondary, England and Wales, grant-aided schools 1,398, scholars 470,003; secondary, Scotland—grant-aided schools 252, scholars 156,645; secondary, Northern Ireland—grant-aided schools 75, scholars 14,557; universities, students: England 41,707 (full time, 36,378); Wales 3,089 (full time, 2,970); Scotland 10,384 (full time, 9,841); Northern Ireland 1,590 full time students.

Banking and Finance.—Revenue, ordinary (actual 1939–40) £1,049,189,000; expenditure, ordinary (actual 1939–40) £1,816,873,000; public debt (national) March 31, 1940, £8,931,000,000. (*See* BANK OF ENGLAND.)

Table I.

ESTIMATED REVENUE 1940–41

	£	£
Income Tax	450,500,000	
Surtax	75,000,000	
Estate Duties	85,100,000	
Stamps	19,000,000	
National Defence Contribution and Excess Profits Tax	70,000,000	
Other Inland Revenue Duties	1,000,000	
Total Inland Revenue		700,600,000
Customs	302,050,000	
Excise	164,050,000	
Total Customs and Excise		466,100,000
Motor Vehicle Duties		35,000,000
Post Office (net receipt)		13,291,000
Post Office Fund		...
Crown Lands		1,150,000
Receipts from Sundry Loans		5,000,000
Miscellaneous		13,250,000
Total Ordinary Revenue		£1,234,391,000

ESTIMATED EXPENDITURE 1940–41

	£
Interest and Management of National Debt	230,000,000
Payments to Northern Ireland	9,400,000
Miscellaneous Consolidated Fund Services	7,600,000
Total	247,000,000
Supply Services	
Defence (token votes*)	4,000
Civil	
Central Government and Finance	3,591,000
Foreign and Imperial	14,185,000
Home Department, Law and Justice	19,543,000
Education	63,396,000
Health, Labour, Insurance (inc. Old Age and Widows' Pensions)	166,892,000
Trade, Industry and Transport	29,614,000
Works, Stationery, etc.	12,896,000
War Pensions 1914–18, and Civil Pensions	41,574,000
Exchequer Contributions to Local Revenues	53,175,000
Unclassified Services*	1,000
	404,867,000
Votes of Credit	2,000,000,000
Tax Collection—Customs and Excise and Inland Revenue votes (inc. Pensions £1,317,000)	14,919,000
	£2,419,790,000
Total 1940–41 Expenditure	£2,666,790,000

*Substantive cost in 1940 to be met from votes of credit.

Trade and Communications.—Overseas trade in million £: imports, merchandise (1938), 920; (1939) 885·9; exports, domestic (1938), 470·8; (1939) 438·8; re-exports (1938) 61·6; (1939) 45·9; bullion and specie, net exports (1938) 73·9.

Table II.—*Overseas Trade, Showing the Variations in the First Eight Months (Jan. 1–Aug. 31) of Each of the Years 1937–40*

(in million £)

	1937	1938	1939	1940
Imports	654.4	616.5	605.9	792.9
Exports	341.4	306.9	313.6	312.6
Re-exports	54.2	42.4	36.3	22.6
Total Exports	395.6	349.3	349.9	335.2

Communications: roads (March 31, 1938): England and Wales, (class I) 20,627 mi.; (class II) 13,070 mi.; Scotland (class I) 6,632 mi.; (class II) 3,967 mi.; Northern Ireland (class I) 1,273 mi.; (class II) 1,933 mi. Railways (Dec. 31, 1938): Great Britain, track open to traffic, excluding sidings, 20,007 mi.; Northern Ireland, standard gauge, 633 mi.; narrow

gauge 121 mi. Airways (1938[1]): distance flown 14,331,000mi.; passengers carried 222,200; mail carried 3,453 tons; freight carried 2,527 tons. Empire services (airways), traffic ton miles including passenger ton miles (1937–38) 7,153,767; (1938–39) 13,734,899; passengers carried (1939) 12,614. Shipping, excluding vessels under 100 tons (July 1, 1939), 17,984,158 gross tons; under construction (July 1, 1939) 791,500 gross tons; shipping (net tonnage with cargo), entered (monthly average 1938) 5,698,000; cleared (monthly average 1938) 4,907,000; entered (Aug. 1939) 6,617,000; cleared (Aug. 1939) 5,525,000. Motor vehicles licensed (Sept. 30, 1938): cars 1,944,394; hackney vehicles (taxis, buses, coaches, etc.) 87,730; commercial vehicles 590,397; motor cycles 462,375; total 3,084,896. Wireless receiving set licences (Sept. 30, 1939), 9,085,050; telephones (Dec. 31, 1939): number of stations (including public and private lines, call boxes, etc.), 3,235,500.

Agriculture, Manufactures, Mineral Production:—Production in 1938: (in metric tons) wheat 1,996,200; oats 2,023,700; barley 918,800; potatoes 5,197,100; beet sugar 294,200; hops 131,000; coal 231,875,000; iron ore (metal content) 3,615,000; pig iron and ferro-alloys 6,871,000; steel 10,561,000; sea fisheries (wet fish only) 1,062,665; whale oil 221,100; benzol 218,800; shale oil 132,000; beef and veal (1937–38) 688,000; pig meat (1937–38) 415,200; mutton and lamb (1937–38) 257,000; wool 50,300; wood pulp 270,000; silk, artificial 48,285; margarine 211,600; butter (1937) 46,700; cheese 44,400; flax (fibre) (Northern Ireland) 4,100; rye 10,900; lead ore (metal content, 1937) 26,800; aluminium (smelter production) 23,000; superphosphates of lime (1937) 449,000.

Table III.—*Agricultural Production, in Thousands of Metric Tons,* and Acreage England and Wales, 1938 and 1939.*

Crops	1938		1939	
	Thous. met. tons	Acres	Thous. met. tons	Acres
Wheat	1,855	1,830,261	1,555	1,682,616
Barley	803	885,499	794	910,073
Oats	1,069	1,300,530	1,119	1,358,008
Mixed Corn	74	92,240	72	82,781
Seeds hay	1,281	1,184,082	1,700	1,302,858
Meadow hay	3,131	4,229,308	4,535	4,611,564
Beans (for stock-feeding or seed)	106	129,817	109	132,968
Peas (for stock-feeding or seed)	30	38,153	23	36,800
Potatoes	3,486	474,786	3,312	453,976
Turnips and Swedes	5,081	421,190	4,947	394,249
Mangolds	3,599	212,531	3,938	208,891

*One metric ton = .98421 English ton.

Industry and Labour.—Index of industrial production (1929=100) av. (1938) 115·5; av. (Jan.–June 1939) 123·1; index of employment (1929=100) av. (1938) 111·0; av. (Jan.–June 1939) 113·5. Industrial population, insured (July 1939) 14,838,000; unemployed, wholly, av. (1938) 1,423,662 (10·3%); temporary, av. (1938) 378,918 (2·8%); wholly (Aug. 12, 1940) 613,156 (4·1%); temporary (Aug. 12, 1940) 154,380 (1·04%).

(*See* also BLOCKADE; DEMOCRACY; EUROPEAN WAR; JAPAN; PROPAGANDA; SHIPPING, MERCHANT MARINE; STRATEGY OF THE EUROPEAN WAR; SUBMARINE WARFARE.)

Greece. A kingdom in the Balkans, with an area of 50,147 sq.mi. and a population estimated at 7,150,000, was ruled in 1940 by King George II, but the real power was concentrated in the hands of General John Metaxas, who had made himself dictator of Greece on Aug. 4, 1936, and who had also assumed in addition to the premiership the portfolios of foreign affairs, war, navy, air and education. General Metaxas had abolished parliamentary democracy in Greece and introduced fascist principles as the basis of political and cultural life. At the same

PROGRESS of Greek-Italian hostilities in Albania to Dec. 31, 1940

time, he had taken great care to modernize the Greek army also to introduce progressive social legislation. In the educa of the youth, the Spartan tradition was more stressed than Athenian, and the birth of a new, third Hellas was proclain The events of 1940 revealed clearly that the governmen General Metaxas had achieved at least one of his aims, tha military preparedness.

In her foreign policy Greece found herself at the beginnin 1940 supported by a British and French pledge, given in A 1939, to aid Greece should her independence be threatened. promise had been given in view of the danger to Greece im in the Italian occupation of Albania in April 1939, which caused much uneasiness in Greece. Later on this uneasiness lessened in view of Italy's repeated declarations of non-ag sion and peaceful intentions. Greece, a member state of Balkan Entente, found herself in especially close relations Turkey. Both states followed the same policy of a strong to defend their independence against any aggression and of ing upon the help of Great Britain in case of such aggressio

The situation changed after the entrance of Italy into the and after the failure of fascist expectations to defeat C Britain in the early summer of 1940. As the war dragge and as the power of resistance in the British Isles grew, the powers drew up plans for a blow against Great Britain in eastern Mediterranean. For that purpose, they wished to oc Greece, and perhaps Turkey, so as to secure the control o eastern Mediterranean. In preparation for such a step, the ian press launched a violent campaign against the Greeks in 1940, accusing them of maltreating the Albanian minority in Epirus, a part of northwestern Greece bordering on Albania, the capital of Yannina. The Greeks, however, were not intimid Though they stressed their determination to cling to their trality, they made it clear that they would resist any inva of their territory. In the early months of the autumn the C army was put on a partial footing of mobilization. The C army is rather small, its effective strength in 1938 being officers and 65,000 men. But in view of the compulsory mil service which begins in the 21st and lasts up to the 50th the army is much larger if fully mobilized. The equipme the army has lately been modernized, although it was in 194

[1]At the outbreak of war all empire services were suspended with the exception of weekly return flights to Kisumu and Durban. In April 1940 a London-Lisbon air line was inaugurated, and in June a Durban-Sydney route (*via* Tanganyika, Egypt, Palestine, Iran, India, Burma and the Dutch East Indies), connecting with the service from Sydney to Auckland, N.Z.

t good when compared with modern requirements. The guns d were largely of French or German make. The air force was imated in 1938 as consisting of ten groups, each of three flights, h flight having four aircraft. The Greek army made up, howr, for its technical deficiencies by its excellent spirit and by its termination to defend the native soil even against a much surior aggressor. The Greek navy consisted of only one 10,000-n cruiser and one small 2,400-ton cruiser, both constructed bee the war of 1914–18. In addition, there were 14 destroyers, 9 pedo boats, 6 submarines and some miscellaneous craft. With s small army, air force and navy, Greece had to meet in the l of 1940 the full onslaught of the highly militarized fascist lian force.

At 3:00 A.M., on Oct. 28, the Italian minister to Athens transtted to General Metaxas an ultimatum, according to which lian troops would move into Greece by 6:00 A.M. the same rning if the Greek government refused to agree to an occupan of certain undefined parts and ports of Greece by Italian ops, air force and navy for their fight against Great Britain. e Italian government seemed to have relied on "fifth column" operation in Greece to bring about Greek surrender, either imdiately or after a brief show of resistance. In reality, General taxas not only rejected the ultimatum but the Greek nation wed itself completely united in its fight against fascist aggrsn. Great Britain was asked for help, which was immediately thcoming. The British air force established a base on the eek island of Crete, and its bombers not only helped the Greek force but hit successfully Italian invasion ports. Some British chanized forces came to the help of Greece, and the royal y proved of the utmost value.

As the Italians had prepared for the invasion of Greece for ny months, by building the necessary roads in Albania and by cting there fortified places from which to launch their attack, y were able to achieve some initial successes and to penetrate a few miles into Greek territory, in the north towards the t important Greek city on the road to Salonika, Florina, and the south against Yannina. The Italian air force at the same e bombed Salonika, Patras and other Greek cities and ports. t soon the strong Italian air force was to lose completely the trol of the air over Greece and Albania, so much so that on n. 2, 1941 the Italian high command had to ask officially for rman air squadrons to come to Italian aid, and the Italian army s defeated by the Greek defenders who were able at the begin-g of November to carry the war into Albanian territory. Dur-November the Italian retreat turned into resounding defeat, which the numerically and technically inferior Greek army was e to occupy large parts of Albania. In the north the important lian base of Koritza, in the south the equivalent Italian base Argyrokastron fell into the hands of the advancing Greeks, o occupied also Porto Edda, the southernmost Albanian port, med after Mussolini's daughter, and pushed on along the coast vards Valona. In December the biting cold and heavy snowrms slowed up the Greek advance, but at no moment were the lians able in 1940 to stop the Greeks or, in spite of all their parations, to launch a counter-offensive.

(*See* also ALBANIA; BALKAN ENTENTE; EUROPEAN WAR.)

(H. Ko.)

eenland. The world's largest island (736,518 sq.mi., some 705,000 covered by glacier), in the Arctic ocean, W. of Iceland, and a Danish possession. Capital, Godthaab. population of about 18,000 (est. 1940) is scattered in small tlements on the west coast, and 1,000 on the east coast, about in all being Danes, the rest native Greenlanders. Seats of the vernors are Godhavn in the north and Godthaab in the south.

History.—When Germany occupied Denmark on April 9, the status of Greenland was brought in question. On Nov. 2 came a report through Stockholm that a Norwegian patrol had foiled the attempt of a German expedition to take Greenland, or at least the weather bureau and wireless stations. Lacking reports from these stations since April, neither the German air force nor civilian authorities anywhere in the north Atlantic region could accurately forecast storms.

From time to time since 1916 the U.S. government indicated that it considered Greenland to lie within the scope of the Monroe Doctrine, stating in 1920 that it could not recognize the right of a third government to acquire the island. After April 9, 1940, at the instigation of the Greenland officials, the U.S. established a consulate at Godthaab, sent a Red Cross representative to investigate conditions, and facilitated purchase of arms for the police at the cryolite mine in Ivigtut. Trade formerly managed by the Danish government monopoly was in 1940 arranged through the Greenland delegation in New York, headed by the Greenland governor, Eske Brun. (F. D. S.)

Grenada: *see* WEST INDIES, BRITISH.

Grenfell, Sir Wilfred Thomason (1865–1940), British medical missionary, was born at Parkgate, Cheshire, England, Feb. 28, and died in Charlotte, Vt., Oct. 9. For a biographical sketch see *Encyclopædia Britannica,* vol. 10, p. 876.

Guadeloupe: *see* FRENCH COLONIAL EMPIRE.

Guam, a possession of the United States of America and the largest and most populous island of the Marianas, lies at the southern end of that group, approximately 1,500 miles E. from Manila; area about 225 sq.mi.; population on July 1, 1940, 23,067, including 21,502 natives of Guam who are called Chamorros; the remainder are foreign-born or personnel of the naval establishment.

The capital and only city is Agana, having about one-half the total population of the island.

The island was discovered March 6, 1521, by Magellan and remained a Spanish possession until June 21, 1898, when it was captured by the United States, later being ceded to the United States by the treaty of Paris. Since acquisition it has been under the jurisdiction of the navy department with a naval officer commissioned as governor by the president. The people are nationals and are regarded as wards of the United States; they are not citizens.

Immigration, while not prohibited, is not encouraged and no alien may own land.

Public schools had an average enrolment of 4,694 during 1939–40. Emphasis is placed upon the English language, health and sanitation, and upon industrial and agricultural training. Health and sanitary conditions are very satisfactory. All medical attention is given by the naval medical officers who treat the people free of charge.

Hospitalization is also provided without cost. The only bank is the Bank of Guam, conducting a commercial banking business as a division of the treasury of the naval government of Guam, which owns the capital stock. Copra is the principal export; 1,482 tons, valued at $50,553, were exported during the fiscal year 1940; total exports were $102,575; imports amounted to $642,936. The community is essentially an agricultural one. The land is fertile and native foodstuffs are plentiful. Guam is an important link in the transpacific air route operated by Pan American Airways system. (L. S. F.)

Guatemala, second largest and most northerly of the Central American republics; language, Spanish; capital, Guatemala city; president, General Jorge Ubico. The area is 48,290 sq.mi. The population (1940 census) is 3,284,269, of whom 65% are Indians. The chief cities (with 1938 official population estimates) are: Guatemala city, 166,456; Cobán, 45,919; Quezaltenango, 41,858; Totonicapán, 40,900; Antigua, 40,000 (unofficial estimate); Jutiapa, 31,723; Quiché, 30,945; Zacapa, 30,113; Jalapa, 28,717; Chiquimala, 27,581; Escuintla, 26,985.

History.—Fear was felt, in 1940, that Guatemala might be used as a centre for the dissemination of German propaganda throughout the rest of Central America and South America. Though Germans are numerically few, the fact that they control 55% of the country's coffee plantations and 60% of the coffee acreage gives them considerable power. Two executive decrees of 1939 barred the nazi party and nazi propaganda from Guatemala, and, as a further precaution, the cities were patrolled by armed soldiers and the country by motorcycle police. Political parties were refused permission to hold public meetings. Guatemala continued to press her claims to British Honduras, asserting that the boundary treaty of 1859 had been invalidated by British noncompliance. In Jan. 1940, Great Britain formally offered to submit the question to arbitration (*see* British Honduras), but no steps had been taken by either side by the end of the year.

Communications.—Steamship and air service are the principal means for external communication, although the partially completed Pan American highway is increasing in importance. In 1940 a 5½-hour New Orleans-Guatemala air service was inaugurated by the TACA air lines.

As of Dec. 1939, Guatemala had 1,360 km. of railway and 6,098 km. of highway (of which 5,932 km. were open to traffic), with 1,040 km. of highway under construction, and 487 km. projected. Early in 1940, over half of the important 473-km. highway from Guatemala city to the Petén region had been finished. Completion of this highway is expected to eliminate the necessity of using air transport in the movement of chicle from the northern Petén region to Puerto Barrios. Air traffic, both internal and external, increased during the year.

Agriculture.—Guatemala, primarily a one-crop country, suffered from a decline in coffee prices as a result of the European war, but hopes were expressed that increased exports to the United States of such crops as bananas and chicle would alleviate the situation. Further easing of the situation may follow recommendations of a commission sent from the United States to scout the possibilities of rubber cultivation in Guatemala. Under terms of the Inter-American Coffee Quota agreement of Nov. 1940, Guatemala was allowed coffee exports to the United States of 535,000 bags of 60 kg. each (1938: 453,866 bags). Imports in 1939 were $15,295,729 (United States, 54·5%; Germany, 27·0%), exports $16,985,310 (United States, 70·7%; Germany, 11·5%). In the first nine months of 1940 imports declined 19% and exports 9%. Banana production in 1939 was 34% greater than in 1938. Bananas accounted for 32·3% of total export values. Chicle exports of 1,920,051 pounds valued at $684,361 (a 12·1% increase in quantity and 33·3% in value over 1938) went to the United States.

Finance.—The monetary unit, the quetzal, is equal in value to the United States dollar.

Education.—Guatemala has over 2,500 schools, with an enrolment in excess of 145,000 pupils.

Defence.—Military service is compulsory. The army numbers 7,000 men.

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Guiana, French: *see* French Colonial Empire.

Guillaumat, Marie Louis Adolphe (1863–194 French soldier, v born in Bourgneuf, Jan. 4, and died in Paris, May 18. For a b graphical sketch see *Encyclopædia Britannica,* vol. 10, p. 969.

Guinea: *see* French Colonial Empire; Portuguese Colon Empire; Spanish Colonial Empire.

Guise, Duke of: *see* Bourbon, Jean Pierre C. M. de.

Gustavus V (1858–), king of Sweden, of whom a b graphical account will be found in the *Encyc pædia Britannica,* vol. 11, pp. 11–12, came to the throne in 1 and, at the age of 82, is the oldest of the monarchs of Euro That he is well loved by his people was attested at his 2 jubilee and especially at the great nationwide celebration of 80th birthday in 1938. Since 1914 he has stood out as a lea of the movement for inter-Scandinavian peace and co-operat In the autumn of 1939 he called to meet him in Stockholm rulers of Denmark and Norway, and the president of Finla to indicate a moral solidarity of the states of the north. But abhors war, and although he is a constitutional monarch, his perience and prestige give him considerable influence in the co cils of state. Undoubtedly he has exercised this influence stea to keep Sweden out of war, and in the popular mind he has come the leader of the strict peace policy. (F. D. S.

Gynaecology and Obstetrics. On the North Ameri continent the slow constant decline in the maternal death-rate continued in 1 The three chief causes of maternal deaths were still to be li as haemorrhage, toxaemia and infection.

The steady improvement, or lowering, in the maternal de rate recorded year after year was favourably affected, first, the discovery of sulphanilamide and its related preparations the successful treatment of puerperal infections, and second further haematologic studies of value in the prevention and tr ment of shock from haemorrhage. Improvement in the stand of ordinary routine antenatal care of pregnant women effecti lessened the incidence of serious toxaemia of pregnancy, thus has lowered its death-rate. Nevertheless, there were no discoveries of note about either the cause or the treatmen pregnancy toxaemia once it becomes established in a pati Dieckmann of Chicago was to publish a monograph on its la developments.

Sulphanilamide greatly lowered the death-rates from infect where streptococci were the chief organisms involved. Unfo nately, however, staphylococcic septicaemic infections were affected by sulphanilamide, and remained as universally f as they had been until sulphathiazole was synthesized and in duced by Fosbinder and Walter, and by Lott and Bergein. especially applicable to staphylococcic sepsis, staphylocc pneumonia, and in pyelitis, or kidney infection, caused by bacillus pyocyaneus.

Obstetric deaths from haemorrhage may now be better an pated and prevented. Anaemias which appear in women p ously well differ from pernicious anaemia by not respondin treatment with liver extract and iron, and usually disappear spontane after the pregnancy ends. Some of these, clearly iron deficiencies, do res but the severe grades of this type of anaemia may require blood transfu These anaemias seem to be associated with and may be the result of ce vitamin deficiencies (A, E and D).

It has been recommended that plasma protein and haematocrit es tions be made routinely on patients about to undergo major operat especially if they show any degree of anaemia. When the plasma pr is normal or high and haematocrit is low, transfusion with whole b should be prepared for by the typing of suitable donors, or even by g prophylactically before the operation. The findings should show that w blood transfusion is warranted before undertaking it lightly as it stil certain risks to the patient.

When reversed findings are observed, namely, low plasma protein and h haematocrit readings, transfusion with blood plasma only is required, this is a simple and safe procedure. Blood plasma is the fluid part of od, the cells having been removed, and its administration requires no vious typing and matching of bloods of donors and patients. It is an al emergency measure.

Kastlin of Pittsburgh was undertaking a series of these estimations pre- post-operatively in gynaecologic and other surgical patients in an rt to anticipate and prevent surgical shock. He was in 1940 extending research to obstetric patients, so many of whom become shocked dur- the course of prolonged labours and difficult deliveries.

Vitamins.—Vitamin deficiencies, due to dietetic defects, seem to have e pronounced ill effects during pregnancy than during ordinary life, bably because of the extra demands made by the growing foetus. Defi- cy in vitamin B complex is associated with certain types of neuritis pregnant women (tingling or numbness in extremities, pain along nerve ks and backache). There is also tingling and burning of the tongue heightened colour and a smoothing of the surface. Vitamin C defi- cy has been blamed as a causative factor in habitual or repeated abor- s; it causes certain purpuric skin eruptions and haemorrhagic lesions of gums, or the early symptoms of scurvy, formerly seen in advanced es more commonly than now. It is interesting that the vitamin C irement during pregnancy as compared to that of normal average is approximately doubled due to foetal demands. Adequate supplies of vitamin must be forthcoming because it has a direct influence on al development, especially affecting subsequent dentition in the child. min D is essential for proper calcium metabolism in the mother, drained some instances by the progressive bone development of the foetus. min E has been called the antisterility vitamin, because a lack of this he diet is considered a contributing fault in sterile marriages, and in ated abortions. Vitamin K has an influence on the prothrombin con- of both maternal and foetal bloods and their clotting ability. Thus a or deficiency of vitamin K predisposes to postpartum bleeding, and bleeding of a haemophilic nature as well as intracranial haemorrhage ew-born infants.

Hormones.—Varying results have been reported by numerous investi- rs who have used for patients with different endocrine deficiencies cer- of the hormones extracted from animal sources. The only ones with sistent effects are, still, those made from the thyroid gland for thyroid ciency, and those used for the relief of menopausal symptoms at the of "change of life." These latter are prepared from animal extractives certain chemical radicals, synthetically constructed, likewise have rogenic properties or effects. The synthetic preparation termed stil- strol was in 1940 still under investigation. Although its clinical effective- had been demonstrated, it had not yet been released for commercial because of certain toxic reactions that have been reported following use. Salmon, Walter and Geist utilized an ingenious method to obtain ore prolonged therapeutic effect than is possible when stilboestrol is inistered by mouth or by hypodermic injection. Under local anaesthesia, make a small skin incision and implant crystals of the preparation he subcuticular tissues, closing the wound with sutures for healing. s method was being used in 1940 also at the Johns Hopkins hospital presumably elsewhere, and reports about it were gradually forthcoming.

Operative Technique.—Operative technique in gynaecologic surgery under- t changes, usually and properly slow to be adopted because anything posed as an improved method must be thoroughly tried out by many ics before being generally accepted. Two examples suffice to illustrate point. De Lee of Chicago proposed and persistently advocated for years in Caesarean section it was safer and gave better results to make the ine incision through its lower segment rather than in the upper portion he body of the uterus as was customary by the "classical" operation. contention was finally proved and accepted by innumerable operators ong lists of cases. In 1934 Phaneuf advocated a transverse rather a vertical incision in the lower uterine segment for delivery by sarean section. This seemed, theoretically, to offer greater technical culties and risks, but actually in practice, as Phaneuf contended, these oretical objections do not exist, bleeding is less, and by his method one ssured that the incision stays in the lower segment as it should and as intended.

nother example of changing technique is that of hysterectomy or oval of the uterus, where this becomes necessary, through the vagina ead of through an abdominal incision, blood vessels being controlled er clamps instead of by tied ligatures of catgut. Kennedy of Phila- hia has been the foremost advocate of this method, claiming it to be a h shorter and less shocking operation with less risk of infection than abdominal type, especially for patients not in the best of physical con- on. He is able to perform some of these operations in as little as ten utes time. Many clinics were in 1940 adopting this method for certain es of cases.

till another item of technical interest is the prevailing abandonment of ut sutures for closure of the heavy fascial layers of abdominal incisions avour of interrupted, buried, nonabsorbable silk or linen sutures. It been demonstrated that there is less local reaction in the tissues than catgut, and this is important in the prevention of postoperative ture and herniation, especially in those tissues undergoing the greatest in during the healing process. It was thought, previously, that only orbable suture material could be used in areas where this was to be ied and allowed to heal in, on the ground that nonabsorbable sutures as silk or fine wire would act as foreign bodies in the tissues, causing ble later. It has been found, however, that this is not true, that these ires become embedded in fine fibrous or scar tissue, and that wound ling is generally stronger with fewer "stitch abscesses."

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(P. T.)

Gypsum. After having dropped during the depression years from a peak of some 12,500,000 metric tons annually to about 7,100,000 tons, world gypsum production was in 1940 again approaching the pre-depression level. The principal producers, with their approximate outputs are: United States 3,000,000 tons; France, Spain, United Kingdom and Canada, each about 1,000,000 tons; Germany 850,000 tons; Italy 400,000 tons; the remainder is widely distributed among some two dozen different countries, few of which have outputs as high as 100,000 tons.

The 1938 output in the United States, 3,196,000 short tons, was the greatest since 1930, with the output gradually increasing as the building industry comes back more nearly to normal, and military camp and defence plant construction will presumably improve the demand. Preliminary figures for 1940 show an improvement of about 10%.

About 19% of the current output is used in cement manufacture in crude form, and 2% goes to various minor uses; the remainder is calcined and, except for some 3% that is used in the glass and ceramic industries, is absorbed in the production of plasters, wallboard and other building products. U.S. production is supplemented by imports, chiefly from Canada, to the extent of about 20% of the consumption. Canadian production in 1939 was 1,408,000 short tons, and preliminary figures for 1940 indicate a 10% rise over 1939; about 80% of the output is exported, nearly all to the United States. (G. A. Ro.)

Haakon VII (1872–), king of Norway, of whom a biographical account will be found in the *Encyclopædia Britannica,* vol. 11, pp. 50–51, was born Prince Charles of Denmark, second son of Frederick VIII (and brother of Christian X). Upon the separation of Norway from Sweden he was elected king by the Norwegian storting (Nov. 18, 1905), and took the old Norse name of Haakon, and that of Olav for his son the crown prince. Haakon married Maud, youngest daughter of King Edward VII of England.

Haakon VII proved himself well adapted to the difficult position of a sovereign in a democratically-minded country. He stood aside from political strife, and represented his people in worthy fashion. In the crisis of 1940 he displayed a calm heroism in the face of national disaster and repeated bombing attacks seemingly aimed particularly at him. He fled from place to place in southern Norway, then to the north. On June 7 (35 years to the day from the achievement of Norway's complete independence) he and the rest of the government took ship for England, where they established headquarters. He firmly refused the request of four members of the "presidential board of the storting" that he abdicate. (*See* also NORWAY.) (F. D. S.)

Hadfield, Sir Robert Abbott (1858–1940), British metallurgist, was born in Sheffield, Nov. 29, and died in London, Sept. 30. For a biographical sketch see *Encyclopædia Britannica,* vol. 11, p. 63.

Haggard, William David (1872–1940), professor of surgery at the medical school of Vanderbilt university, Nashville, Tenn., was born in Nashville, Sept. 28. He received his doctor's degree from the University of Tennessee in 1893 and began to practise in Nashville. Three years later he was appointed professor of gynaecology and abdominal surgery in the University of Tennessee, serving until 1912. Since 1913 he had been professor of surgery at Vanderbilt. He enlisted in the army medical corps during the World War of 1914–18 and was surgeon of Evacuation Hospital No. 1 at Toul, France, 1918–19, and was consultant in surgery at the Mesves Hospital

Center, France. He was elected president of the American Medical association in 1925, the Postgraduate Medical Assembly of North America in 1930 and the American College of Surgeons in 1932. He was one of the organizers of the Southern Medical congress. He died in Palm Beach, Fla., Jan. 28.

Hagner, Francis Randall (1873–1940), U.S. genito-urinary surgeon, was born in Washington, D.C., Feb. 19, was graduated from the medical school of George Washington university in 1894, and began practice in Washington, D.C., in 1896. He was attached to Johns Hopkins hospital in Baltimore in 1895–96 and was professor of genito-urinary surgery in George Washington university from 1905 to 1939, when he was made professor emeritus. He originated several operations which were adopted by other surgeons. At one time he was president of the Clinical Society of Genito-Urinary Surgeons.

He died in Washington, July 7.

Hainisch, Michael (1858–1940), former president of the Austrian republic, was born at Aue, Lower Austria, Aug. 15. He died at Gloggnitz, Feb. 29. For a biographical sketch see *Encyclopædia Britannica,* vol. 11, p. 78.

Haiti, a West Indian republic occupying the western third of the island of Hispaniola; language, French; capital, Port-au-Prince; president, Stenio Vincent. The area is 10,204 square miles. The population is approximately 3,000,000, and is almost entirely Negro.

The chief cities are Port-au-Prince, pop. 125,000 and Cap Haitien, pop. 14,000. These and Fort Liberté, Cayes and Saint-Marc are the most important ports.

History.—During 1940 the economic uncertainty which had characterized Haiti in the preceding year crystallized into an acute economic depression as the country began to feel the full effects of the European war's disruption of international trade. Coffee, the chief money crop and main reliance of the Haitian small landholder, was especially hard hit, as the value of coffee shipments, normally half of the export total, declined by 45%. In an effort to bolster shrinking government revenues, an additional export duty was levied on coffee, but its effects were to impair materially the saleability of the commodity. At the end of September a third of the crop was still unsold. The Inter-American Coffee Quota agreement in November, allotting 275,000 bags as Haiti's quota for export to the United States, gave promise of some economic relief, but did not provide for the full crop, estimated to be 400,000 bags for the 1940–41 season, particularly since over a third of the 1939–40 crop had gone to European markets no longer open. Politically, interest centred about the presidential elections of May 1941, as strong pressure was brought to bear upon President Vincent to be a candidate for a third term.

Education.—Haiti has over 400 primary and secondary schools, with total enrolment of 50,000. The University of Haiti is at Port-au-Prince.

Finance.—The monetary unit is the gourde, fixed by law at 20 cents U.S. The gross public debt on Sept. 30, 1940, was $12,103,124, a 21% increase over the previous year and 38% over 1938. Expenditures on public works in the 1939–40 fiscal year totalled $1,751,000. Fiscal control is in the hands of a financial adviser nominated by the president of the United States.

Trade and Communication.—External communication is by sea and by air. In 1940 there were 164 mi. of railway and in excess of 1,000 mi. of motor highway. Imports for the fiscal year ending Sept. 30, 1940, totalled $7,940,200 in value, a decline of 2·3%, and consisted largely of textiles, foodstuffs and m cellaneous manufactured articles. Exports were $5,399,000 drastic decline of 25·7% from 1938–39, and comprised co (38·0%), sugar (17·5%), sisal hemp (12·5%), bananas (11·7 cotton (11·3%) and cacao (1·8%). Imports came largely fr the United States (73·31%), followed by Great Britain (11·78 France (4·26%), Japan (2·79%), the Netherlands and Neth lands West Indies (1·9%) and Belgium (1·57%). These rep sented a sharp increase from the United States over the prec ing two years (1937–38, 55·09%; 1938–39, 62·96%); a mod ate increase for Japan; a slight decline for Great Britain, the virtual disappearance of imports from Germany (5·65% 1938–39). Exports were taken by the United States, 52·09% marked increase over 43·11% in 1937–38 and 34·73% in 19 39); Great Britain, 30·21% (a sharp rise from 18·88% in 19 39); Belgium, 9·39%; France, 4·25%; and Denmark, 1·76%

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Halifax, Edward Frederick Lindley Wood, 3RD VISCOUNT (1881–), British statesman. See *Encyc pædia Britannica,* vol. 11, p. 93 for his biography. On Feb. 1938, he succeeded Anthony Eden (*q.v.*) as foreign minister retained this post through the "Munich era" and through various reshufflings of the war cabinets of Chamberlain Churchill. On Dec. 23, 1940, he was named British ambassa to the United States. Eden then resumed his former posi at the foreign office.

Hambro, Carl Joachim (1885–), Norwegian sta man, was born at Bergen Jan. 5 and was educated at Oslo university. In 1913 he bec editor of the Oslo *Mogenbladet,* for which he had worked ing his days as a student. In 1919 he was elected on the ti of the Conservative party to the Norwegian storting, of w he became president seven years later. A fervent believer in League of Nations, Hambro was elected president of the assembly which expelled the U.S.S.R. from membership in League for its aggression against Finland. After the Ger occupation of Norway in April 1940, Hambro was forced to the country. In reply to German Foreign Minister Ribbentr claim of documentary evidence that Great Britain had plan the invasion of Norway, Hambro declared on April 28 at St holm that he had "irrefutable proof that Germany prep detailed plans for the invasion of Norway months befor actually occurred."

Hammer Throw: *see* TRACK AND FIELD SPORTS.

Hand-ball. Hand-ball continued its popularity in 1940. H grounds, high schools, colleges and other m yearly offer increasing facilities for the game to both men women of all ages. The classic event is the national A.A.U. f wall championship held every year. In 1940, the Downt Y.M.C.A. of Detroit, Mich., was the host with entries repres ing every section of the country. The winner of the singles the sixth consecutive year, was Joseph Platak of the Lake S Athletic club, Chicago. In the doubles, Joe Gordon and J Goldsmith of Long Beach, Calif., were the victors.

National Four-Wall Rankings for 1940

Singles	*Doubles*
1. Joseph Platak, Chicago	1. Joe Gordon and J. L. Golds Long Beach, Cal.
2. Jack Clements, San Francisco	2. Edward Linz and Frank C New York
3. Angelo Trulio, Brooklyn	3. G. Cappell and R. Maguire Francisco

There was considerable interest manifested in the one-wall me which is played almost exclusively in the east. New York city s been the scene of all the national tournaments in this branch the game and is considered to have the best players in the untry.

National One-Wall Rankings for 1940

Singles	*Doubles*
Morton Alexander, New York	1. Morton Alexander and Marvin Hecht, New York
Victor Herschkowitz, New York	2. J. Garber and J. Londin, New York
Leon Black, New York	3. S. Lipsky and V. Herschkowitz, New York

Women's Rankings (One-Wall, New York Metropolitan District)

Lucy Caruso 2. Mrs. Blanche Goodman 3. Hannah Singer (Fr. Ro.)

ınson, Ole (1874–1940), U.S. mayor and real estate operator, was born in Racine county, Wis., Jan. 6, d studied law from 1890 to 1894 in Racine. In 1902 he went Seattle, Wash., and engaged in the real estate business. He ved in the state house of representatives in 1908–09. He was cted mayor of Seattle in 1918 and won national fame for his tlement of an extensive strike in Feb. 1919. Hanson moved to uthern California in 1924 where he engaged in real estate operons. He died in Los Angeles, July 6.

ınson, Richard Burpee (1879–), Canadian legislator, was born March 20 in Andrews, N.B. and received his law degree from Dalhousie iversity in 1901. He practised law in Fredericton, N.B. for a mber of years and was active in municipal politics there, being ayor from 1918 to 1920 and city solicitor from 1920 to 1926. was elected to the house of commons in May 1921, but parliaent was dissolved before he took his seat. He was re-elected in 21, 1925, 1926 and 1930, and was defeated in 1935. From 1934 1935 he was minister of trade and commerce in the Bennett binet. On May 14, 1940 he was chosen leader of the opposin (Conservative) party to succeed Dr. R. J. Manion, who had en defeated in the general election of March 26.

arbours: *see* Rivers and Harbours.

ırington, Sir Charles Harington (1872–1940), British general, was rn in Chichester, May 31, and died in Cheltenham, Oct. 22. was governor of Gibraltar from 1933 to 1938 and was the thor of a life of Field Marshal Viscount Plumer. For further ographical details see *Encyclopædia Britannica,* vol. 11, p. 196.

ırkness, Edward Stephen (1874–1940), U.S. philanthropist, was born in eveland, Ohio, Jan. 22, the son of Stephen V. Harkness, one of early associates of John D. Rockefeller in the Standard Oil mpany. He studied at Yale university and was graduated in the ıss of 1897. By the successive deaths of his father, mother and other he came into possession of the vast family fortune, part which was invested in the Southern Pacific and the New York ntral railroad companies. He was a director in each company. s chief interest, however, lay in the distribution of the princi- l and income of his fortune to charitable and educational institions. His mother, by a gift of $30,000,000, established the mmonwealth fund for general philanthropic purposes. In 1938, r. Harkness increased this fund by a gift of $8,000,000. He tablished the Pilgrim trust in England by an endowment of 0,000,000 for promoting the future well-being of Great Britain. offered $3,000,000 to Yale for the erection of a group of uses to bring the students in closer contact with one another and with their instructors. When it was rejected he offered the money to Harvard. It was accepted and the houses were built, but it took $8,392,000 more than his original offer to Yale to complete the work. Yale changed its mind and he gave $12,000,000 to that university for carrying out a similar plan; he gave more than $6,000,000 to Columbia university and $7,000,000 to Phillips Exeter academy. His gifts were estimated at $100,000,000. He died Jan. 29 in New York city.

Harrington, Francis Clark (1887–1940), U.S. army officer and commissioner of the Work Projects administration, was born in Bristol, Va., Sept. 10, and was graduated from the United States Military academy in 1909. He afterward studied in the engineering school of the U.S. army, the general staff school, the Army War college and in the French War college. He advanced through various grades till he reached the rank of colonel in 1938. During the World War of 1914–18 he was an instructor in officer training camps. He also served as instructor in mathematics at West Point and as assistant engineer of maintenance at the Panama canal. In 1935 he was appointed assistant administrator of the Work Projects administration under Harry L. Hopkins. When Mr. Hopkins was appointed to the cabinet Harrington was named as commissioner of the WPA. He died in New London, Conn., Sept. 30.

Harvard University, oldest institution for higher education in the United States, completed the fourth year of its fourth century in 1940. At the end of the fiscal year, June 30, 1940, investments exclusive of land, buildings and contents used for educational purposes stood at $143,922,931. Gifts during the year were $3,462,044 for capital account and $1,395,898 for immediate use.

Scholarships and other student aids totalled $710,137, exclusive of student loans. The year 1940–41 began with an enrolment of 7,845 full time students and a faculty and educational administrative staff of 1,930. The university library, largest university library in the world, had 4,159,606 volumes and pamphlets on June 30, 1940.

Harvard inaugurated a new combined seven-year course under the faculties of arts and sciences and of law, leading to the A.B. or S.B. and the LL.B. degrees. Announcement was made that the university will start in 1941 a new five-year course in dental education, made possible through gifts of $1,300,000; the dental school will be renamed the School of Dental Medicine, and dental school students will register in both the new school and the medical school. Professor Francis T. Spaulding became dean of the graduate school of education, succeeding Dean Henry W. Holmes who became chairman of the university's committee on educational relations. The school of education established a new section of educational administration. Harvard opened a new department of Celtic, headed by Associate Professor Kenneth H. Jackson, formerly of Cambridge university, England. During the summer the university established its fourth astronomical observatory, in the Colorado Rocky mountains. Instruction for undergraduates in required English composition was extended with the establishment of five special instructorships in addition to the regular teaching staff.

Hats for Women: *see* Fashion and Dress.

Havana Conference: *see* Central America; Cuba; Hispanic America and the European War; Neutrality; Pan American Union.

Hawaii. The territory of Hawaii consists of a group of eight larger islands and numerous islets in the Pacific ocean

between latitudes 18°55′ and 22°15′ N. and between 154°50′ and 160°30′ W. longitude. Their total area is 6,438 sq.mi. The islands are of volcanic origin. From southeast to northwest, they are Hawaii, Kahoolawe, Maui, Lanai, Molokai, Oahu, Kauai, Niihau. In addition, stretching northwestward beyond Niihau over 1,100 mi. is an archipelago of rocks, reefs and shoals which includes Midway (longitude 177°22′ W.) notable as the first stop beyond Honolulu of the China clipper planes. Likewise, 960 mi. south of Honolulu and a part of the city and county of Honolulu lies Palmyra, a coral atoll consisting of 55 islets, five miles long and two and a half miles wide. The youngest island, geologically, and the largest in the group is Hawaii, with an area of 4,030 sq.mi.

The capital of the territory is Honolulu, situated on the island of Oahu. It is a completely modern city with a population (1940 preliminary census figures) of 179,358. The population of Hawaii (1940 census figures) is 423,330. The racial origin of this population, in addition to the native Hawaiians and Caucasians from the mainland, is Japanese, Chinese, Korean, Filipino, Portuguese. However, 82% of the population is native born.

The governor in 1940 was Joseph B. Poindexter; and the delegate, Samuel W. King. The territory collected in taxes and fees $15,429,059.08 in 1940, and expended $16,501,566.48. In addition, federal taxes were paid into the United States treasury of $9,721,626.41, exceeding the payment of 12 states of the union.

Agriculture.—Hawaii's chief crops are sugar and pineapples. Expert management, scientific methods, and costly irrigation works have raised the sugar production to a maximum of 1,035,548 tons in 1933 with a value of $66,482,181. The value of the 1939 sugar shipments was $55,217,926. The pineapple industry, next in importance, produced 848,003,809 lb. with a value of $50,822,533. Other agricultural crops are coffee, macadamia nuts, papayas and taro, a root used by the natives in making the native "poi" and also now being processed into flour.

The tourist industry has developed rapidly since 1920, reaching a total of 65,431 visitors in the calendar year 1939.

Hawaii has assumed an increased importance as a defence outpost. Probably the strongest fortifications in the Pacific are located on the island of Oahu. (R. EM.)

Hawthornden Prize: *see* LITERARY PRIZES: *Great Britain.*

Hay. Acre yield of tame hay in 1940 in the United States, at 1.40 tons per acre, was 12% better than the ten-year average and has been exceeded but twice in 20 years. Total production was estimated by the department of agriculture in October as 86,312,000 tons, compared with 76,099,000 tons in 1939 and a ten-year (1929–38) average of tame hay of 69,650,000 tons. With the 1940 production of wild hay at 8,844,000 tons, the total crop of all kinds of hay was 95,156,000 tons. This includes 30,578,000 tons of alfalfa hay. *See* ALFALFA. (S. O. R.)

Table I.—*Production of Tame Hay by States, 1940 and 1939*

	1940 tons	1939 tons		1940 tons	1939 tons
Wisconsin	7,416,000	5,829,000	Vermont	1,113,000	1,133,000
Iowa	6,572,000	4,994,000	North Dakota	1,109,000	1,126,000
New York	5,554,000	4,177,000	Utah	1,062,000	968,000
Minnesota	4,702,000	4,773,000	Oklahoma	983,000	755,000
California	4,657,000	4,184,000	North Carolina	975,000	984,000
Illinois	4,515,000	4,292,000	Wyoming	927,000	808,000
Ohio	4,241,000	3,594,000	Maine	877,000	918,000
Michigan	4,064,000	3,436,000	West Virginia	833,000	722,000
Missouri	3,524,000	3,239,000	South Dakota	765,000	707,000
Pennsylvania	3,238,000	2,658,000	Georgia	648,000	581,000
Indiana	2,828,000	2,716,000	Alabama	606,000	596,000
Idaho	2,287,000	2,160,000	Massachusetts	586,000	504,000
Washington	1,864,000	1,891,000	Maryland	550,000	517,000
Montana	1,836,000	1,900,000	South Carolina	539,000	541,000
Colorado	1,684,000	1,542,000	Connecticut	484,000	412,000
Kentucky	1,629,000	1,582,000	Arizona	445,000	490,000
Kansas	1,580,000	991,000	Louisiana	438,000	406,000
Tennessee	1,579,000	1,629,000	New Hampshire	427,000	394,000
Oregon	1,532,000	1,476,000	Nevada	382,000	338,000
Nebraska	1,366,000	1,132,000	New Jersey	367,000	319,000
Texas	1,341,000	1,022,000	New Mexico	303,000	266,000
Virginia	1,252,000	983,000	Delaware	101,000	91,000
Mississippi	1,223,000	1,140,000	Florida	59,000	51,000
Arkansas	1,193,000	1,080,000	Rhode Island	56,000	52,000

Table II.—*Production of All Kinds of Hay in the U.S., 1940 and 1939*

	1940 tons	1939 tons
All kinds of hay	95,156,000	85,124,000
All tame hay	86,312,000	76,099,000
Wild hay	8,844,000	9,025,000
Alfalfa hay	30,578,000	26,888,000
Clover and timothy hay*	29,287,000	23,780,000
Grains cut green for hay	4,260,000	3,901,000
Cowpeas for hay	1,567,000	1,623,000
Peanuts for hay	1,003,000	878,000
Soybeans for hay	1,618,000	1,460,000
Lespedeza hay	3,700,000	3,816,000
Sweet clover hay	808,000	1,028,000
Sweet sorghums for forage and hay	13,816,000	8,704,000
Miscellaneous tame hay	8,536,000	7,545,000

*Does not include sweet clover and lespedeza hay.

Table III.—*Hay Seed Production in the U.S., 1940 and 1939*

	1940 bushels	1939 bushels		1940 bushels	1939 bushels
Red clover	1,994,400	1,798,100	Timothy	1,312,900	1,417,800
Alsike clover	106,000	95,000	Lespedeza	159,120	145,37[illegible]
Alfalfa	1,453,000	1,488,200	Sweet clover	900,700	1,417,000

Hay Fever: *see* ALLERGY; AIR CONDITIONING: *Physiological Benefits.*

Head, Sir Henry (1861–1940), English neurologist, was born Aug. 4, and was educated at Trinity college, Cambridge, and the universities of Halle and Prague. He was a fellow of the Royal College of Physicians as well as fellow of Trinity college. He was noted for his study of nerve sensations which led to the subdivision of the human body into definite zones now called Head areas. He lectured at Fordham university in New York city in 1912. He wrote *Areas of Pa[illegible]* *Studies in Neurology* and several other medical books and was knighted in 1927. He died in Reading, England, Oct. 9.

Health Insurance: *see* SOCIAL SECURITY.
Hearing Aids: *see* DEAFNESS.

Heart and Heart Diseases. Wartime needs in 19[illegible] the second year of w[illegible] tended to submerge other aspects of medical advance, in [illegible] study of the heart as well as in other fields. There was a [illegible] emphasis of the importance of the recognition and proper h[illegible] dling of what was called the "soldier's heart" in the war of 19[illegible] 18, but which has been more properly, though not yet qu[illegible] satisfactorily, labelled "neurocirculatory asthenia." Obviou[illegible] much more study of neurocirculatory asthenia was needed th[illegible] had been expended in the past, not only because of its obscur[illegible] but also because of its great importance in wartime, and ind[illegible] even in peacetime. In brief, it consists, when well marked, o[illegible] group of symptoms which are in large part circulatory a[illegible] nervous: palpitation (and often rapid heart beating), shortn[illegible] of breath (usually with sighing), heartache with short sh[illegible] precordial stabs (not angina pectoris), faintness (and often s[illegible] cope), dizziness, easy fatiguability, increased perspiration, tren[illegible] and nervousness. It has been variously wrongly called he[illegible] disease, thyrotoxicosis (exophthalmic goitre without exophth[illegible] mos), an infectious or toxic state, malingering and a psychoneu[illegible] sis, all of which it loosely resembles. Although the heart its[illegible] is normal structurally in uncomplicated cases, nevertheless neu[illegible] circulatory asthenia may be so severe that it is a cause for [illegible] ability, partial or complete, temporary or permanent. Le[illegible]

ublished, after 20 years, a second edition of his useful little book n the "soldier's heart." Among others, Fraser wrote again on the ubject, advising immediate discharge from the military services f all of those with high degrees or ineradicable causes of this ondition. Of greatest importance, however, was the step taken y the subcommittee on cardiovascular disease of the National esearch council of the U.S.A. in the course of its revision of the my's criteria for admission of new recruits; this consists of the nmediate rejection of all those candidates who show more than minimal degree of the condition, carefully excluding the posble effect of any temporary illness such as an acute respiratory fection. This step was taken because of the fact that during and ter the war of 1914–18, neurocirculatory asthenia far more than ny actual heart disease was a cause of bothersome and pronged disability among soldiers, helping to overcrowd convalesnt wards and camps and veterans' bureau hospitals, which ould have been devoted to cases of trauma and acute illnesses. Other cardiovascular contributions of importance or special terest during 1940 included proof of the influence of diabetes ellitus in increasing the early incidence of coronary artery disse (Root *et al.*); the demonstration by careful injection and -ray technique of the remarkable anastomoses of the coronary teries in the development of coronary disease (Schlesinger, lumgart and Davis); the decreasing mortality from rheumatic art disease in the age group from 5 to 25 years old in the S.A. (O. F. Hedley); the demonstration that fever in congesve heart failure is to be ascribed to some complication, espeally to pulmonary infarction or infection even though such may concealed (Kinsey and White); the introduction of a new mptom of early failure of the right ventricle, namely, liver pain effort (Boyer and White); the proof that rheumatic mitral enosis may permit survival beyond 80 years of age (White and and); and the important facts that arteriosclerotic aneurysms the thoracic aorta in aged persons should not only be recogzed as such in contrast to luetic aneurysms, with avoidance of necessary and probably harmful specific treatment, but that ch aneurysms may by rupture themselves be the cause of death Ruffin, Castleman and White).

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eidenstam, Carl Gustaf Verner von (1859–1940), Swedish author, was born at Olshammar, July 6, and died in Stockholm, May . See *Encyclopædia Britannica*, vol. 11, p. 387.

ejaz: *see* ARABIA.

elium. The only commercial sources of helium in the world are the natural gas fields of southwestern United ates. The Cliffside helium reserve, covering 50,000 ac., which pplies the government-operated helium recovery plant at Amillo, Tex., has an estimated reserve of 100,000,000,000 cu.ft. of tural gas with 1·8% helium and produced 383,062,000 cu.ft. of gas, while the recovery plant produced 6,281,800 cu.ft. of helium in the fiscal year ending June 30, 1939 and an additional 3,906,000 cu.ft. in the second half of 1939. The bulk of the output is supplied to the army and navy for aircraft use, but 1,068,300 cu.ft. was sold to non-government purchasers during the year, 265,800 cu.ft. for medical, 9,600 cu.ft. for scientific and 792,900 cu.ft. for commercial purposes. Mixed with oxygen, helium is a valuable substitute for air in the treatment of asthma, laryngitis, croup and diphtheria, as the effort required for the breathing of this mixture is only about half that required for air. The difficulty known as "bends," suffered by divers and caisson workers when coming out of high pressure, is due to the liberation in the capillaries of small bubbles of nitrogen which had become dissolved in the blood under heavy pressure; this may be obviated by the use of a helium-oxygen mixture instead of air, since helium is insoluble in the blood, but as yet the cost of helium is too high to make its use possible under ordinary working conditions. The use of helium for the inflation of toy balloons is being promoted, in order to avoid the liability of injury to children from the explosion of hydrogen-filled balloons. The substitution of helium for hydrogen in test balloons was being made in 1940 by the U.S. weather bureau and will eventually require some 1,500,000 cu.ft. annually. (G. A. Ro.)

Heredity. There have been two considerable advances in the field of sex-determination. The forms in which the female is diploid and the male haploid have long constituted a problem. In one of these, the parasitic hymenopteran *Habrobracon*, the work of Bostian and of Whiting has now shown that there is a series of allelic genes of such a nature that an individual carrying only one (either haploid or diploid and homozygous) is male; an individual carrying any two different members of the allelic series is female.

It has been supposed that one of the effects of polyploidy in a dioecious species must usually be an upset of the sex-determining mechanism. While this conclusion remains probable for many organisms, it has been shown not to apply to the seed-plant *Melandrium*, where tetraploid races have no disturbance of the sex-determining system, as shown by Westergaard and by Warmke and Blakeslee. This is because in this plant the chief male-determining element is the Y chromosome, rather than the autosomes as in previously analyzed cases.

There is a growing body of evidence suggesting a simple relation between genes and specific proteins. Among the most striking examples are those found in the species hybrids of doves; but here, as in most other clear-cut examples, the results have been based almost exclusively on the proteins of the red blood cells. The work of Cumley and Irwin has shown that, in these same dove hybrids, similar relations hold also for the differences in serum proteins. The result strengthens the hypothesis that many proteins owe their specificity directly to gene activity. In this connection, attention should be called to Wiener's excellent summary of the existing state of knowledge concerning the blood-groups of man.

There are a number of different sex-linked characters in man, and these should be linked to each other. The available evidence on the point has been scanty, and has suggested that such linkage is close.

White has now reported on a family in which both colour-blindness and night-blindness were present, and has presented a large family tree. It is clear that these two sex-linked genes give at least 40% recombination, so that it must now be supposed that there is much crossing over between the two X chromosomes of the human female.

Another result in human genetics was reported by Lennox,

Gibbs and Gibbs, who have studied the electroencephalographs of epileptic patients. There is a characteristic "brain-wave" pattern, present in extreme form during an epileptic attack, but recognizable at all times in people who are or have been subject to such attacks. The studies show that this same pattern may also be recognized in some of the relatives of epileptics—and that the pattern behaves as a simple Mendelian dominant character.

Evidently this is the inherited element in epilepsy, and about one in twenty individuals having the pattern shows the symptoms of epilepsy.

Numerous studies have appeared in the field of "physiological genetics," including a book by Waddington that attempts to formulate a general theory of the relation of genes to development. One result here may be noticed: as the outcome of a series of studies by many workers, it has been found that the effects of the eye-colour hormone of insects (a hormone whose production is under simple genetic control) may be simulated by the known chemical substance kynurenin. (*See* also GENETICS.)

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Hering, Hermann S. (1864–1940), U.S. Christian Scientist lecturer, was born in Philadelphia, Pa., Aug. 24 and was graduated from the University of Pennsylvania in 1886. He took special courses in electrical engineering in London in 1889, after teaching in the manual training school in Philadelphia. He was an associate in electrical engineering at Johns Hopkins university from 1891 to 1899. He became interested in Christian Science in 1897 and was a reader in the church at Baltimore for five years. In 1902 he was made first reader in the Mother Church in Boston, and later he was made president of the church and a member of the board of lectureship. He spent his time after 1905 lecturing throughout the United States and other countries. He died in Boston, May 15.

Hershey, Lewis B. (1893–), deputy director of the U.S. selective service, was born on a farm near Angola, Ind., and was graduated from Tri-State college at Angola. In 1916 he went to the Mexican border with the Indiana national guard, was advanced to lieutenant, and later was commissioned captain at Fort Sill, Okla. He went to France with the 137th field artillery in 1918 and upon his return to the United States passed his examinations for a commission in the regular army. He was then stationed at the field artillery school at Fort Sill and subsequently at Ohio State university, where he was assistant professor of military science and tactics for four years, at the command and general staff school for two years, and at the Army War college, where he graduated in 1934. After completing the latter course he was sent to Hawaii for two years. In 1937 he was appointed to the joint army and navy selective service committee as executive secretary. He was largely responsible for laying the foundation and setting up the machinery for the selective service system which went into effect during 1940. In recognition of this work he was raised to the rank of brigadier general in Nov. 1940.

Heyward, DuBose (1885–1940), U.S. author, was born in Charleston, S.C., Aug. 31 and was educated in the public schools. His father died when he was two years old, and at the age of nine he helped support the family by selling newspapers. When he was old enough he worked on the Charleston docks. His first book of poems, written in collaboration with Hervey Allen, was *Carolina Chansons,* published in 1922. His first and most successful novel, *Porgy,* appeared in 1925. Among his other novels are *Peter Ashley* (1932), *Lost Morning* (1936), and *Star Spangled Virgin* (1939). He died Tryon, N.C., June 16.

Highways: *see* ROADS AND HIGHWAYS.

Hill, Eben Clayton (1882–1940), U.S. roentgenologist, was born in Baltimore, Md., Oct. He was graduated from Johns Hopkins university in 1903 and spent the next two years as a research student at the University of Freiburg, Germany. Returning to Baltimore, he was graduated from the Johns Hopkins medical school in 1907. He practised medicine in Baltimore and Poughkeepsie and while in the latter city was roentgenologist in the Vassar hospital. He returned to the faculty of Johns Hopkins in 1920. From 1917 to 1919 he served with the U.S. medical advisory board. He died June at Fitchburg, Mass.

Hillman, Sidney (1887–), U.S. labour leader, was born at Zagare, Russia, on March 23, the son of a merchant. In his youth he studied to become a rabbi but left school to work in a chemical laboratory in Kaunas. In 1907 he migrated to the United States, where he worked first as a clerk then as a garment cutter. In Chicago he interested himself in labour unions, led a successful strike in a clothing house and by 1915 was president of the Amalgamated Clothing Workers of America, an office he still occupies. He went to Washington in the early days of the New Deal and became a member of the labour advisory board of the NRA. He served on the National Industrial Recovery board in 1935, and the next year as treasurer of Labor's Non-Partisan league, campaigned vigorously for the re-election of President Roosevelt. Later he was a member of the textile and clothing industry committees for the Fair Labor Standards board and was elected vice-president of the Congress of Industrial Organizations. Upon the organization of the advisory commission to the council of national defence May 28, 1940, Hillman was named commissioner of employment. With William S. Knudsen (*q.v.*) he became the most prominent figure in U.S. defence activity Jan. 7, 1941, when President Roosevelt appointed him associate director general of the Office of Production Management, the new "superdefence" agency.

Hispanic America: *see* LATIN AMERICA.

Hispanic America and the European War.

The first problem to arise from the "Graf Spee" incident during 1940 was the necessity on the part of Argentina, involuntary hosts of around 1,000 of the "Graf Spee" crew, to determine upon their disposition. At first, despite British protests, they were permitted to remain in Buenos Aires, but when several disappeared (aboard Italian ships, it was freely believed), steps were taken to effect a partial internment, and many were sent into the interior. During the course of the year, however, a considerable number succeeded in escaping the country.

Two near-repetitions of the "Graf Spee" incident occurred during 1940, as British auxiliary cruisers, the "Alcantara" in July and the "Carnarvon Castle" in December, entered Rio de Janeiro and Montevideo respectively for repairs after engagements with German naval units in the south Atlantic.

Economic Effects.—Of more vital consequence to the American republics was the effect of the war upon their external trade relationships. Almost without exception their economy has rested upon the export of one to three prime raw materials. While the United States was, in most cases, the principal purchaser of these goods, sales to European countries represent

nsiderable portions of their exports. In the earlier months of 940, loss of the German market and curtailment of many purases by France and Great Britain were strongly felt. During 938, Germany had taken from 13 different Hispanic American untries proportions of their exports ranging from 7·7% (Mexo) to 23·5% (Uruguay), and, even in 1939, from 6·8% to ·1% of the exports of 12 of those countries. On certain comodities the proportion was even greater. Thus, Germany had rchased over half of Venezuela's coffee in 1938, and had nked second in coffee purchases from seven of the other eight ading Hispanic American producers. Fifteen Hispanic Ameri-n countries in 1938, and 16 in 1939, purchased a minimum of % of their import requirements from Germany. Only Cuba d received less than 5% of its imports from Germany in her year.

Although enhanced sales of foodstuffs to France and Great itain stimulated the export trade of some areas, notably the ata region, these increases were only partially effective, for eat Britain, lacking the ready cash with which to pay, was mpelled to impound the proceeds and to seek deferred credits other ways. Consequently, Argentina and Uruguay, the gest beneficiaries of British war buying, were faced by serious ortage of foreign exchange with which to meet obligations ewhere.

The already mounting effect of the war upon Hispanic Amer-a was tremendously accelerated when Germany opened its ring campaign against Denmark and Norway, following it th invasion and conquest of the Netherlands and Belgium, and entually of France. Spread of the war to these hitherto neutral gions and, in effect, to Sweden, now cut off from direct commerl contact overseas, dealt a staggering blow to Hispanic Amerin economy, for the Scandinavian countries alone had absorbed arly 15% of Hispanic America's exports in 1939. Too, Scanavian shipping had been highly important in the transportation goods, and loss of these facilities tended to cripple commerce roughout Hispanic America.

Fifth Columnism.—Following disclosure of the role played by th columnists in facilitating German invasion and conquest of orway and other countries, Hispanic American countries genally felt alarm over fifth columnism within their own borders. any investigations, both government and private, were made, d some of the disclosures aroused alarm and near-panic. In ne plots aimed at the overthrow of the Uruguayan government ere uncovered, and to sustain public morale two United States uisers visited that country. Fears were felt, especially in azil, Argentina and Chile, that German- and Italian-descended izens of these countries would become focal points for totalirian agitation. In the case of the latter, little or no evidence any widespread and concerted movement was disclosed, but rious pro-nazi activity in some sections of Argentina, notably Misiones territory, developed toward the end of the year. ost of the fifth columnism, suspected or proven, centred dictly in the diplomatic and consular offices of the axis powers. exico, in consequence, requested the press attaché of the erman legation to leave the country, and, upon his failure to so, promptly handed him his passports. In Costa Rica secret ms caches were uncovered by government agents.

Inter-American Co-operation.—The year was marked by seval efforts at formal co-operation. As early as Jan. 1940, the ter-American Neutrality committee, an outgrowth of the Panna conference, began meetings at Rio de Janeiro, and studied easures to control or prevent violations of the "safety zone." he Inter-American Financial and Economic Advisory commite, likewise set up by the Panama conference, met at Washingn to devise means of offsetting the loss of markets and other

A MILITARY MISSION of nine Hispanic American republics began a two-week tour of U.S. defences Oct. 1, 1940. Here they inspect a relief map of Hispanic America in the Pan-American building at Washington, D.C.

disturbing economic effects of the war. One of its more important results was a plan for an inter-American bank.

The Havana Conference (July 21–30, 1940).—At Panama, ten months earlier, the desire was to strengthen the hemisphere's neutrality and to cushion the economic shocks of the war. Although these were still live problems at Havana, the more urgent question was that of hemisphere defence. Politically and economically, the war had come closer to the Americas. When the conference met, it promptly gave attention to statements of United States policy just enunciated by that nation in which it formally declared it would not recognize the transfer of any geographic regions of the western hemisphere from one non-American power to another. The United States also proposed a trade cartel, and, through its minister to Uruguay, announced that it would lend any assistance desired to crush alien seditious activity which might imperil the political and economic freedom of any American nation, should it be requested. In view of past timidity on the part of the United States in expressing its policies, these statements had a thoroughly heartening effect on Hispanic American statesmen who feared to advocate strong measures lest they be left unsupported.

All 21 of the American republics were represented at Havana, although only ten foreign ministers were present. In all, 44 projects and resolutions, conventions and declarations were presented for consideration; the meeting approved 26 of them, in addition to a convention dealing with European western hemisphere possessions, which required ratification of two-thirds of the American republics before coming into force. Pending this ratification, an emergency measure, the Act of Havana, provided for the setting up of provisional administrations in any European territories where changes of sovereignty were imminent. The act's provisions were to be administered by an emergency committee composed of representatives of each of the 21 republics, but the committee's functions would be transferred to an inter-American committee for territorial administration when two-thirds of the republics had ratified the convention itself. Terri-

tories where sovereignty was in dispute, as the Falkland islands and British Honduras, were specifically exempt.

Along economic lines, attention was given to a proposed huge cartel, but the project failed of support and was never formally submitted. Further resolutions were for strengthening and expanding the activities of the Inter-American Financial and Economic Advisory committee, and for encouraging study of all possible measures for increasing domestic consumption and inter-American trade. Subsequently, under sponsorship of the Financial and Economic Advisory committee, representatives of the 14 coffee-producing republics and of the coffee-consuming United States developed an Inter-American Coffee Quota system, whose details were ironed out and formally approved on Nov. 28 (*see* BRAZIL). Instruments were created for inter-American co-operation in temporary storage, financing, and marketing of all surplus commodities.

A further resolution provided for immediate consultation in the event that any republic was threatened by fifth column activities and requested such action.

Regional Conferences.—Subsequent to the Havana meeting, the Hispanic American republics continued to work for joint action. Argentina and Brazil held consultations from which resulted a trade treaty and in October similar discussions were held by representatives of Argentina, Bolivia, Brazil, Paraguay and Uruguay, with the announced objective of effecting a customs union. Another conference, of republics in the Amazon basin, was called by President Vargas of Brazil. The United States Export and Import bank gave important financial aid through credit grants to several countries.

Preparations for Defence.—In the later months of the year, especially after the United States agreement with Great Britain under which it acquired naval and air base rights in various British territories in America (*see* WEST INDIES, BRITISH), much attention was directed toward proposals for United States acquisition of sites in various parts of Hispanic America as part of the defence program. Rumours of negotiations for bases in Chile, Peru, Ecuador (the Galapagos islands), Costa Rica, Uruguay and other countries were rife at different times, but only in Uruguay did they openly take on an official nature. A proposal that Uruguay grant rights to a base at Punta del Este on the Atlantic coast evoked strong protests from Argentina as well as within Uruguay itself, and although tacitly approved with many reservations by the Uruguayan congress, it had not been crystallized into any definite agreement by the close of 1940. (*See* the articles on individual countries, especially BOLIVIA, CHILE, COSTA RICA, ECUADOR, LATIN AMERICA and URUGUAY. *See* also EUROPEAN WAR.)

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(L. W. BE.; C. N. G.)

Hispaniola: *see* DOMINICAN REPUBLIC; HAITI; WEST INDIES.
Historical Association, American: *see* AMERICAN HISTORICAL ASSOCIATION.

Hitler, Adolf (1889–), German statesman, was born at Braunau on the Inn in Austria on April 20. For his early career, see *Encyclopædia Britannica,* vol. 11, p. 598. In the so-called Munich Beer Hall Putsch of Nov. 9, 1923, Hitler attempted with Ludendorff, Goering, Frick, Streicher, Roehm and others to seize the Bavarian government, but was arrested, tried for treason, and condemned to imprisonment at Landsberg. Here he dictated to his secretary, Rudolf Hess, his famous book, *My Struggle* (*Mein Kampf*).

It is in part an autobiography and in part an exposition of his ideas for the regeneration of Germany, and is hence sometimes called the "Nazi Bible." On his release from prison in Dec.

"BLACK-OUT," as drawn by Holland in the *Nashville Banner*

1924, as a result of a general amnesty, he devoted himself building up various organizations to strengthen the nazi part Brown Shirts, Elite Guard (*Schutz-Staffeln* or "SS"), Hit Youth (*Hitler Jugend*) and other formations. With the aid these, with efficient lieutenants, and with his magnetic orato his nazi party grew rapidly in power, winning 12 reichstag se in 1928 and 230 in July, 1932. On Jan. 30, 1933, Hitler was a pointed Reich chancellor and began the social and political rev lution establishing the "Third Reich." Upon Hindenburg's de Aug. 1, 1934, Hitler succeeded him as president but became kno as Reich Leader (*Fuehrer*) and chancellor. He became absol master of the Reich and succeeded in rebuilding Germany's mi tary might within five years. In 1933 he withdrew from League of Nations; in 1935 he decreed compulsory military se ice; the next year he marched into the Rhineland. In 1938 he nexed Austria and, by the pact of Munich, dismembered Czec slovakia. His last "white conquest" was the absorption of Czec slovakia and Memel in March 1939; war resulted from his mands on Poland. For events in his career in 1940, *see* G MANY. (S. B. F.; X.)

Hockey: *see* ICE HOCKEY.

Hogs. A general decline in the swine census began in a num of countries in 1940 and indicated further reductions supplies of pork in 1941, particularly in Europe. War and sc city of feedstuffs limited breeding and caused above-nor slaughter of swine in Europe. In the United States unusually la numbers of hogs on farms and a lack of export markets for l and pork caused declines in both the spring and fall pig cr At the beginning of 1940 the agricultural department repor 58,312,000 hogs on U.S. farms, compared with 49,293,000 in 1 The number of pigs saved in the U.S. spring crop in 1940 was 007,000 as against 52,343,000 in the spring crop of 1939, a dec

Swine Census in Different Countries in 1940 and 1939

Exporting countries	1940	1939	Importing countries	1940	1939
United States	58,312,000	49,293,000	England & Wales	..	3,510,000
Canada	5,882,000	4,294,000	Scotland	..	253,000
New Zealand	714,000	683,000	N. Ireland	..	627,000
Argentina*	..	..	Norway	..	366,000
Australia*	..	..	Belgium	856,000	960,000
Ireland (Eire)	1,058,000	943,000	France	..	7,127,000
Denmark	3,199,000	2,997,000	Switzerland	958,000	880,000
Sweden	..	1,579,000	Germany	29,100,000	25,613,000
Netherlands	..	1,553,000	Austria	..	2,872,000
Hungary	4,649,000	5,808,000	Czechoslovakia	1,607,000	1,949,000
Jugoslavia	3,503,000	3,451,000	Greece	..	430,000
Rumania	..	3,165,000	Italy*	..	..
Latvia	..	891,000	U.S.S.R.*	..	..
Lithuania	1,160,000	1,117,000			
Estonia	..	442,000			

*Argentina had about 4,000,000 hogs in 1937. No figures are available for Australia, a small producer of pork. Italy had 3,940,000 hogs in 1938 and Russia 30,600,000.

about 8%, with a still greater reduction indicated for the 1940 fall crop, as compared with the 1939 fall crop of 31,985,000 pigs. The department of agriculture estimated that slaughter in the hog-marketing year beginning Oct. 1, 1940, would be about 10% less than in the preceding year. U.S. exports of fresh pork during the first year of the war, beginning Sept. 1939, were 45,673,000 lb., a decline of 40%. Exports of lard to the United Kingdom and Europe were reduced drastically, but large increases in exports to Latin America brought the first war year's total of U.S. lard exports to 247,000,000 lb., a decline of only 6% under the preceding year's exports. Pork production in Canada was 604,000,000 lb. in 1939, the largest on record. Preliminary estimates placed 1940 Canadian production at a still higher figure, 1,035,000,000 lb. Early in the war Great Britain contracted with Canada for unusually large supplies of bacon and other pork products, running to at least 5,600,000 lb. per week, or an annual basis of 291,000,000 lb. up to Oct. 31, 1940. A favourable feed ratio also caused increase in swine breeding in Canada so that in 1940 the hog census had increased to 5,882,000, from 4,294,000 head in 1939, and with the 1940 spring pig crop numbering 5,073,000 compared to 3,640,000 in the spring of 1939. The 1940 fall crop was estimated at between 3,700,000 and 4,700,000, compared to 3,726,000 in the fall of 1939. While supplies of pork were normal in Europe, except in France and Belgium, in 1940, scarcity of feeds and wartime slaughter, it was believed, would substantially curtail supplies in 1941. The table shows the swine census for 1940 and 1939 in different countries as given by the office of foreign agricultural relations of the U.S. department of agriculture. (*See* also MEAT.) (S. O. R.)

Holland: *see* NETHERLANDS.

Hollander, Jacob H. (1871–1940), U.S. economist, was born in Baltimore, Md., July 23, was graduated from Johns Hopkins university in 1891, and in 1894 was granted the degree of doctor of philosophy. He was associate professor of finance until 1900; in 1901 he became associate professor of political economy, and full professor three years later. Hollander served as treasurer of Puerto Rico in 1900–01, and in 1905 he was appointed a special commissioner to Santo Domingo to investigate the public debt. In 1907 he was secretary of the bimetallic commission sent to Paris and London to study that question, and from 1908 to 1910 he was financial adviser to the Dominican Republic. In 1931 he was made chairman of the tax survey commission of Maryland. He died in Baltimore, July 9.

Home Building, Federal: *see* FEDERAL HOME LOAN BANK SYSTEM; HOUSING.

Honduras, a Central American republic; language, Spanish; capital, Tegucigalpa (est. pop., 35,000); President, General Dr. Tiburcio Carías Andino. The area is 46,332 sq.mi. The population was officially estimated at 1,014,584 in 1939.

Politically, the outstanding feature of the year 1940 was the strong adherence of the country to western hemisphere solidarity principles. Fifth column activities were combatted and in August compulsory military service was established. In March 1940, a new civil code, replacing that of 1898, was adopted. Some improvement was noted over the depressed economic conditions of immediately preceding years. A significant economic development was the beginning of experimental rubber cultivation along the Atlantic coast, where 50,000 trees were planted and land cleared for an additional 150,000 trees.

External communication is by steamship and Pan American Airways. Airlines link Tegucigalpa with coastal points. Honduras has 840 mi. of railway. The 280-mi. Interoceanic highway straddles the country from north to south; the 90-mi. Honduran section of the Pan-American highway links it with neighbouring El Salvador and Nicaragua. In 1938–39, $574,022 were spent on highway construction and maintenance.

Imports in the fiscal year 1938–39 were $9,703,327; exports were $9,867,156. The United States supplied 65·3% of imports; Germany, 11·4%; Japan, 6%; and El Salvador, 4·9%. Exports, 90·7% of which went to the United States, were principally bananas (63·3%), silver (17%), gold (7·9%) and coffee (2·5%). In addition to bananas and coffee, corn, beans, rice, sugar, tobacco and potatoes are extensively produced for domestic consumption.

The monetary unit is the lempira, valued at 50 cents U.S. The 1940–41 budget estimated revenues and expenditures at $5,424,000 each and allotted $1,097,000 and $552,500 respectively to national defence and education. According to the latest official estimates (1936), there are 965 elementary schools with 33,461 pupils, 93 secondary schools with 2,857 and two normal schools. The Central university of Honduras is at Tegucigalpa.

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(L. W. BE.; C. N. G.)

Hooper, Franklin Henry (1862–1940), editor emeritus of *Encyclopædia Britannica,* was born Jan. 28 at Worcester, Mass. After graduating with high honours from Harvard in 1883 he joined the staff of the Century company and was an editor of the *Century Dictionary* until 1896. He then became literary adviser and manager for the publishing house of James Clarke and Company. His association with *Encyclopædia Britannica* began in 1899, when he became an editor. He was associate editor of the 10th edition (1902), managing editor of the 11th edition (1910–11) and American editor of the 12th, 13th and 14th editions (1922, 1926 and 1929 respectively). From 1932 until his retirement in April 1938 he was editor-in-chief. Mr. Hooper also edited *These Eventful Years* (1924), *The World Today* (1933–38), the first *Britannica Book of the Year* (1938) and *Britannica Junior.* He was accidentally killed by a truck near Saranac Lake, N.Y., on Aug. 14.

Hops. Reduced acreage in Germany and Yugoslavia, labour shortage in England and war effects in France and Poland materially decreased the 1940 hop crop in Europe. In the U.S. the estimated crop of 40,260,000 lb. was 2% larger than 1939 production of 39,380,000 lb. and 17% above the ten-year (1929–38) average of 34,100,000 lb. In Germany the 1940 crop was estimated at 34,000,000 lb. from 34,000 ac., compared with 37,000,000 lb. from 35,500 ac. in 1939. In England the 1940 crop was estimated at 27,000,000 lb. from 18,500 ac., compared with 29,500,000 lb. from 18,800 ac. in 1939. The Protectorate (Bohemia and Moravia) 1940 harvest was 5,800,000 lb. from 7,400 ac., compared with 8,500,000 lb. from 10,000 ac. in 1939. Yugo-

U. S. Production of Hops, 1940 and 1939

	1940 lb.	1939 lb.	1929–38 average lb.
Oregon	18,620,000	19,300,000	18,295,000
Washington	11,700,000	9,212,000	7,353,000
California	9,940,000	10,868,000	8,662,000

slavia's 1940 crop was 3,700,000 lb., from 7,450 ac., compared with 4,000,000 lb. from 7,260 ac. in 1939. In northern France (Alsace, Burgundy and Lorraine) war caused general neglect of the hop yards and the 1940 harvest was estimated at from 2,000,000 lb. to 2,500,000 lb., less than half the 1939 crop. About 25% to 30% of the Polish hop production area was under German domination and the harvest there was estimated at from 1,000,000 to 1,500,000 lb., the U. S. department of agriculture reported. No figures were available from Russian-held areas of Poland.

(S. O. R.)

Hormones: *see* BIOCHEMISTRY; CHEMOTHERAPY; ENDOCRINOLOGY; GYNAECOLOGY AND OBSTETRICS; MEDICINE; PSYCHOLOGY; UROLOGY; ZOOLOGY.

Horne, Robert Stevenson Horne, 1ST VISCOUNT (1871–1940), British statesman, was born in Slamannan, Scotland, Feb. 28, and died in Surrey, England, Sept. 3. For a biographical sketch see *Encyclopædia Britannica,* vol. 11, p. 752.

Horner, Henry (1878–1940), governor of Illinois, was born in Chicago, Nov. 30, and was graduated from the Chicago-Kent College of Law in 1898. He practised law from 1898 to 1914, when he became probate judge for Cook county. He was elected governor of the state on the Democratic ticket in 1932 and was re-elected in 1936. He had been ill for two years when he died in Winnetka, Ill., on Oct. 6.

Horse Racing. During 1940 new records were established in the United States and Canada in numerous different departments of turf affairs. Racing being a year-round sport, it proceeded continuously from Jan. 1 to Dec. 31, allowing only for the Sabbath intermissions—while at New Orleans, La., during the winter, and just over the border at Agua Caliente, Mexico, it proceeded on that day as well.

While the gross number of races run through the year fell short of that for 1939—to wit, 16,443 as against 16,966—the gross amount of money awarded in stakes and purses increased—namely, $15,911,167 as against $15,312,839. The number of different individual thoroughbreds that competed also increased, rising above 14.000 as against 12,804 for 1939. These marked new "highs" in both instances. As previously recorded, the latter-day legalization of race-track betting throughout the country has been chiefly responsible for such gains and in 1940 a further step was taken in that direction when for the first time the "totalizators" (betting machines) were introduced in the state of New York, after a prolonged struggle to keep them out. The result was a large increase in both the amount of money disbursed there and the popular support of the sport, the volume of betting reaching such heights that the tax paid into the state treasury exceeded $6,000,000. No new courses or meetings of any importance marked the season, but 1941 will see the return of New Jersey to activity after a long recession, with several plants of the first magnitude which with little doubt will effect a further upward swing in racing's gross returns.

From the standpoint alike of money value and sporting importance, the great event of the year was the $100,000-added Santa Anita handicap, run on March 2 and won by the seven-year-old stallion Seabiscuit, he thereby making himself the world's large money-winning race horse with a net total of $437,730 and bei the first and only one of any country to reach or pass the $400,0 mark (previous leader Sun Beau, $376,744). Seabiscuit is own by Charles S. Howard of San Francisco, whose stable during t season won $333,870, or almost double as much as the one stan ing second, that of Mrs. Payne Whitney ($174,405).

The leading individual race horse was the three-year-old Bim lech ($110,005), owned by Colonel E. R. Bradley of Kentuck Mr. Howard's three-year-old Mioland was second with $98,5 and the same owner's Seabiscuit third with $96,850; the hor last named being permanently retired immediately after his vi tory at Santa Anita. The leading two-year-old money-winner w Whirlaway, with $77,275, he being owned by Calumet farm (Wa ren Wright) of Kentucky. The Kentucky Derby remained t most brilliant and colourful turf event of the season from t popular side and was won by Gallahadion, owned by Mrs. Eth V. Mars of River Forest, Ill. Through his performance his si the French-bred stallion Sir Gallahad 3rd, became for the fourt time the premier money-winning sire, with a total of $304,705, having previously taken the same rank in 1930 and again in bo 1933 and 1934. He was imported in 1925, is owned by a synd cate and stands at the Claiborne stud in Kentucky. All told, H offspring have won over $2,000,000 on the American turf.

The leading money-winning trainer was Thomas Smith of t Howard stable, with a total of $268,950. The leading ra winning trainer was D. Womeldorf, with a credit of 108. The ra for riding honours was the closest ever known and not decid until Dec. 31, when Earl Dew closed with a total of 287 winne and W. L. Taylor with 286.

From the purely racing standpoint the feature of the seas was the revival of long-distance contests, which came to a clim with the $50,000-added New York handicap at 2¼ mi., a ne event run at Belmont park, N.Y., and won by the four-year-c gelding Shot Put, owned by Mrs. Marie Evans of Chicag Through the season he earned $72,945, chiefly in long races.

Harness Turf.—The season of 1940 was extremely success and marked further gains for this, the typically U.S. form horse racing. The "horse of the year" was the three-year-c Spencer Scott (1:59½), winner of seven out of eight starts, the principal events for his age but one, and over $40,000. H is owned by C. W. Phellis, Greenwich, Conn.; driven by Fr Egan. The mature champion Greyhound (1:55¼), eight years c in 1940 and before the public for seven consecutive seasons, fu ther distinguished himself by winning every race in which he w started and then, when started, beat the existing saddle record f trotters (2:05¼), lowering it to 2:01¾; he was ridden by the la amateur Mrs. Frances Dodge Johnson. The outstanding pacer the year was the three-year-old Fearless Peter (2:00), winner 16 races out of 17 starts. He was in 1940 owned by Dr. L. Guilinger of Andover, O., and was driven by Dr. H. M. Parsha

(J. L. HE.)

Great Britain.—Although the flat-racing season of 1940 Great Britain was confined to rather less than three months, apa from a few meetings in the north and midlands, it was fou possible to decide four substitute classic races, all of which we run on the summer course at Newmarket. English-bred co failed in both the Two Thousand Guineas and the New Der each of which was won by a horse bred in France. Djebel, own by M. Marcel Boussac and ridden by E. C. Elliott, gained an ea victory in the Two Thousand Guineas, but could not be sent ov to England again for the New Derby, which was won by Po l'Evêque. This colt was owned and trained at Beckhampton F. Darling and was ridden by S. Wragg. Pont l'Evêque would al probably have won the substitute St. Leger at Hurst park if it h

ɔt been necessary to abandon the fixture. The outstanding filly f the year was E. Harmsworth's Godiva, whose success in the ne Thousand Guineas and the New Oaks stamped her as a high ass three-year-old. Godiva was trained by W. R. Jarvis and as ridden on both occasions by the apprentice rider, D. Marks. ıe was afterwards sent to race in Ireland, but met with an acci- ɜnt and had to be destroyed. Her untimely death was a severe .ow to the thoroughbred industry. Gordon Richards once again ıde more winners than any other jockey.

The national hunt season also suffered to a large extent from ıforced curtailment, but it was found possible to hold the Grand ational as usual at Aintree. The winner was Bogskar, an out- der owned and trained by Lord Stalbridge, a steward of the ational Hunt committee. Macmoffat finished second for the cond year in succession. The most successful jockey of the ason was T. F. Rimell. (A. K. B.)

orses. The steady decline in the number of horses and mules in the United States in 1940 was at a substantially ıduced rate compared with that of previous years, mainly because a check on ravages of equine diseases (particularly sleeping sick- ɜss or equine encephalomyelitis) but partly because of reduced ıying of tractors by farmers. (*See* FARM MACHINERY.) The ımber of horses in the United States at the end of 1940 was ɔ,500,000, mules 4,150,000, as estimated by Wayne Dinsmore, ɜcretary of the Horse and Mule Association of America. This presented a decline of about 200,000 horses and 150,000 mules. n Jan. 1, 1940, the number of horses on United States farms as estimated by the department of agriculture as 10,616,000; ules 4,321,000. The Horse and Mule Association of America nnounced that sleeping sickness had practically been eradicated 1940 through widespread vaccination of horses and mules. nly 8,008 cases of equine encephalomyelitis were reported in ɔ39, whereas there had been 184,622 in 1938 and 170,000 in ɔ37, with a mortality of, respectively, 25% and 21%. The war Europe resulted in a more active market for cavalry horses in ıe autumn of 1940. In the spring of the year the French gov- nment bought 7,000 horses in the United States. None was ıipped abroad, however, and in July all were sold at reduced rices. The U.S. army bought 2,000 pack mules and 600 riding orses, and later, in October, was authorized to purchase 19,812 ıore riding horses. The U.S. army paid $170 per head for riding r artillery horses. The price included the mileage of the pur- ıasing board which visited different markets to obtain horses. bout $200 per head was paid for pack mules. U.S. army officers eported that the German army had 791,000 horses in active army ervice as of June 1940, and not including horses used in the ervice of supplies. Of this number 406,000 horses were used by ıe German army to draw artillery. (*See* also LIVESTOCK; HOWS.) (S. O. R.)

Horse Shows: *see* SHOWS.

Horticulture. Europe's war had in 1940 a disastrous effect on horticultural conditions in every civilized ountry. The regular flow of seeds, bulbs, fertilizers and insecti- ides was entirely disrupted, and some items were taken off the ıarket. The bulb industry was particularly hard hit, with the esult that importations to the United States from Holland en- rely ceased. This condition served to stimulate the growing of ıe so-called Dutch bulbs in the United States, particularly in ıe northwestern section, but the supply available in 1940 from omestic sources was wholly inadequate. This was true especially f tulips, the supply in the United States in 1940 being hardly ıore than 10,000,000 bulbs, as against 100,000,000 normally imported from Holland. Moreover, 90% of the domestic bulbs consisted in 1940 of forcing varieties, such as William Copeland and William Pitt. Very few good garden tulips could be obtained at the planting season in the autumn of 1940. English growers rather unexpectedly offered to ship tulip bulbs to the United States, and a few thousand English bulbs came over, but there were not enough to make an impression on the market. Some lots went down on ships that were sunk.

STUDENTS OF CONNECTICUT COLLEGE FOR WOMEN conducting experiments of plant nutrition in 1940

The daffodil situation was much better. The number of daffodil bulbs produced in the U.S. goes far toward supplying the market. Most hyacinth bulbs are imported and the number available in 1940 was small. Such miscellaneous bulbs as scillas, muscari, crocuses and snowdrops were available only in limited quantities, although the growing of these bulbs is an industry which is making progress in Michigan.

England has been producing many bulbs in recent years, but has also been Holland's best customer. English growers had to readjust completely their planting operations. Indeed, this was true of all persons engaged in horticultural pursuits in the British Isles, except in Ireland, where commercial rose growing continued without much interference.

Every effort was made to maintain horticulture on a liberal scale in England because of its value in maintaining morale, but there was an ever-growing tendency to substitute food crops for ornamental plants. Amateur garden makers were encouraged to grow both vegetables and flowers. Commercial establishments were maintained, although great damage was suffered because of bombing by the Germans. Garden makers throughout the world learned with regret that the famous Kew gardens near London was severely damaged by bombs, some of the greenhouses being wrecked and many valuable plants destroyed.

It has been impossible to ascertain just what conditions prevail on the European continent. Word has come out of Holland that most of the bulb fields escaped ruin when the country was invaded, but there is reason to believe that at least a part of the area usually devoted to tulips was taken over for the growing of food crops. In any event, the financial loss from the inability of the Dutch growers to sell their bulbs was heavy.

In former years a great many prepared lily-of-the-valley "pips" were sent out of Germany, but of course their exportation largely ceased. United States growers were in 1940 beginning to produce them on a large scale.

Canada's situation was much like that of the United States in 1940 as far as imports from Europe were concerned. Yet it was in a much better position than England and the continental countries because much of the horticultural material it needed was available from the U.S. In peacetime the dominion gets 98% of its tulip bulbs from Holland. Of the 32,000,000 bulbs of other kinds formerly imported, 25,000,000 came from Holland and 3,000,000 from France, Belgium, the Channel islands and Germany. Canadian gardeners will have to do without most of this material in 1941.

The seed situation was exceedingly complicated because of wartime conditions. Few persons realize the extent to which most of the European countries are drawn upon for seeds of different kinds, particularly vegetable seeds. There is not likely to be any serious shortage in the United States except in a few lines, but conditions in the European countries seemed in 1940 less promising. Horticulturists in Finland made an appeal to the United States for vegetable seeds, and large quantities were sent to

Finland from private sources through the Finnish consul in New York city.

The importation of grass seed practically stopped. In former times a large amount of grass seed came from Czechoslovakia, Poland, Hungary and Denmark. The last-named country was, indeed, one of the world's most important sources of grass seed. As it happens, a considerable shipment of seed from that country was afloat when the invasion took place. Some grass seed is to be obtained from New Zealand and Australia, but six weeks are required to make the trip from these countries to the United States and the tropical heat affects germination harmfully unless refrigerated compartments are used. Some seed came intermittently from Scotland and Ireland.

Perhaps the most noticeable shortage of seeds and of plants grown from seeds has to do with herbs for medicinal purposes. Measures were being taken in 1940 to increase the production of medicinal herbs in the United States, but much higher prices for many items appeared to be a certainty.

The matter of vegetable seeds, including herbs, is of particular importance because it seemed likely that more vegetable gardens would be made in 1941 in the United States as well as in Europe than at any time since the war of 1914–18. The National Garden bureau, an organization supported by U.S. seedsmen, concentrated in 1940 on what were called "gardens for defence," urging that amateurs throughout the country make vegetable gardens in 1941.

An effort to stimulate the canning of vegetables and fruits in the autumn of 1940 failed to gain impetus when the fact was discovered that large surpluses of canned goods were to be found in the storehouses of commercial establishments.

The cost of ocean freight, plus the high war risk insurance, made the exportation of canned vegetables almost prohibitive, although there was a steady if limited flow of vegetable products to the British Isles.

One of the most interesting and progressive horticultural developments of 1940 was the growing use of a synthetic hormone solution to prevent what is commonly known as the preharvest drop of apples.

It has been found that this drop can be largely controlled by spraying the fruit a week or two before harvest with a weak solution of naphthaleneacetid.

Much experimental work was being done to determine what results might be obtained from the use of vitamin B_1, colchicine and other synthetic substances. This work was being carried on in many of the colleges and experimental stations, much of the work being in the hands of the students.

(E. I. F.)

Hosiery: *see* RAYON; SILK AND SILK MANUFACTURE.

Hospital Book Guide: *see* AMERICAN LIBRARY ASSOCIATION.

Hospitals. In 1940, the war affected hospitals in all countries—cost and accessibility of supplies, mobilization of staff and personnel and, in some cases, destruction of property. British hospitals for 1940 were carried on under almost insuperable difficulties. As a result of the steady and indiscriminate bombing of civilian areas, more than 25 hospitals in the London area alone were struck by bombs in 1940 and many tients, doctors and nurses were killed. The minister of hea stated that no feature of London's superb resistance surpassed way in which the hospitals were performing their duty.

Some of the hospitals established surgical units complet underground where the surgical work could go on uninterru by air raids. Voluntary hospitals in London were taken o under the emergency situation. Under the Essential Buildi and Plant act and the Personal Injuries act, hospitals regar as essential might obtain loans from the government for rebu ing, and employees, within certain limitations, might rece compensation for injuries sustained by, or in repelling, ene attack. One outcome of the war was the closer linking of voluntary hospitals and the closer co-operation between volunt hospitals and the government. During 1940 the British domini sent several fully staffed and equipped military hospitals Great Britain. A group of the princes of India also complet outfitted a large hospital ship.

Although the United States was not actually engaged in c flict, its preparedness program involved the hospital field. T health and medical committee of the council of national defe had a strong subcommittee on hospitals charged with the t of mobilizing civilian hospital facilities and personnel for national welfare. The American Hospital association conducte national survey of hospital resources. The U.S. army set up surgical, 17 evacuation and 32 general hospitals.

Construction.—Among the new buildings reported in 1940 were 500-bed Royal Melbourne hospital in Australia; the University hosp at San Juan, Puerto Rico; the model 1,200-bed Sodersjukhuset at Sö malm, Stockholm; and the 800-bed Dunedin Public hospital in N Zealand. A well-designed hospital for 1,500 chronic disease patients built on Welfare island, New York city. The Palestine government b at Haifa what has been described as the finest hospital in the near e For the war against cancer the new 12-story Memorial hospital in N York city is an outstanding institution, as is also the smaller Ellis Fis State Cancer hospital at Columbia, Mo. Among the military hospit one of the finest erected was that of the Canadian Red Cross society Cliveden (Taplow) in England. In China, despite severe war conditi General Chiang Kai-shek contributed extensively towards hospital constr tion and maintenance.

Finance.—Of wide interest has been the Nuffield trust (England), a of £1,250,000 to create a central hospital fund designed to promote b regional co-operation and control among voluntary hospitals following recommendations of the Sankey commission. In this connection there wo seem to be a trend towards amalgamation in Great Britain.

In the past few years Birmingham, Liverpool, Sheffield and Bristol, instance, completed or initiated amalgamation plans. In the United Sta of America the remarkable growth of the prepayment plans for hosp care created an increasingly satisfactory source of revenue for hospitals

Equipment.—Perhaps the most important development was the in duction of electrically conductive rubber for flooring, casters and ot purposes. Anaesthetic explosions in many instances were traced to accumulation of static potential. By permitting the dissemination of potential through grounding, considerable lessening of the hazard anticipated.

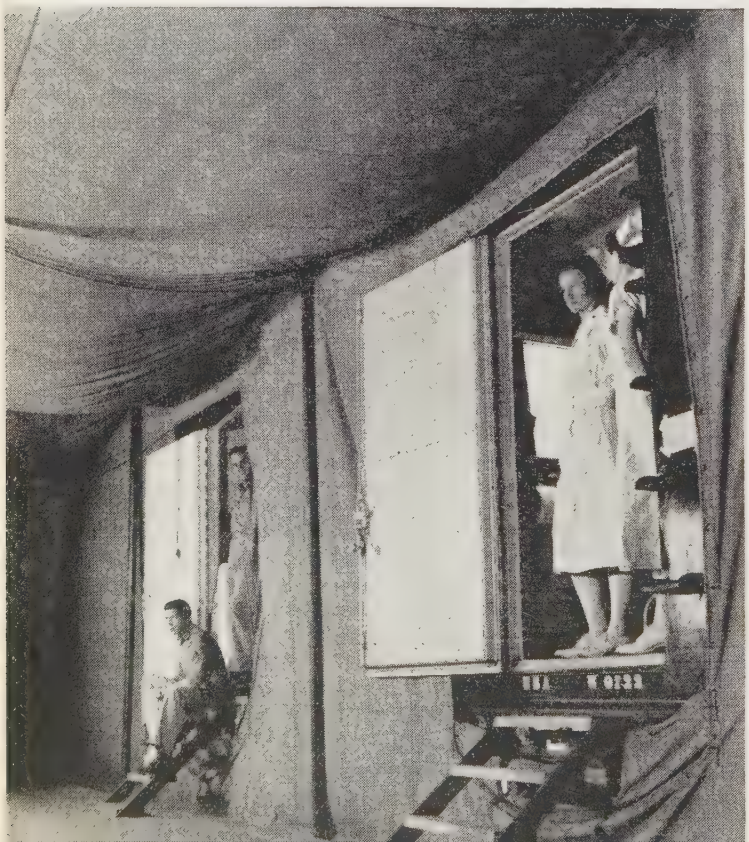
Legislation.—The National Hospital act of 1940 in the U.S.A., passed by congress, would authorize not only an initial appropriation $10,000,000 to build needed rural hospitals but a similar amount for e of five more years for maintenance and construction. A strong natio hospital advisory council of six, representing medical and hospital auth ities, will advise as to need and will outline and supervise standards service.

In Australia, motor accident insurance legislation in Victoria, c pulsory on all motor cars, will do much to protect hospitals and p fessional people supplying service.

Education.—The report of the commission on graduate medical edu tion (U.S.A.) was a definite contribution towards clarifying policies graduate and medical education. Trends in internship and in residency w analyzed and appraised.

International.—Latin-American relations were advanced by the f Latin-American Hospital congress at Santiago de Chile. Thirteen South a Central American countries were represented in this first triennial congr Pan-American relations were advanced by the issuance of *El Libro Hospital Moderno,* a valuable reference book on hospital topics, by publishers of *Modern Hospital.* Covering a wide range of subjects, its c tributors include the leading authorities in the United States and Cent America. There was also a successful institute on hospital administrat at Puerto Rico.

(G. H. AG.)



MOBILE HOSPITAL demonstrated by the U.S. army medical corps in 1940 tent shelter encloses the rears of two trailers—one a sterilizer and one the ope ing room—making them a unit

ousing. The year was one of solid progress in public housing in the United States, achieved by a growing mber of Local Housing authorities operating with aid from the nited States Housing authority and by the Farm Security administration experimenting on various angles of the difficult agrilltural housing problem. Congressional provision for a continuis program in urban slum clearance was in 1940 still lacking. ne urgency of housing for national defence workers deflected deral appropriations to that field. Many phenomena of 1915 to 18 were repeated. Bottlenecks appeared in production for lack workers, who could not be supplied from a distance for lack of using. Local builders produced houses by the dozen where they ere needed by hundreds.

The 1940 emergency found the United States better equipped, ministratively and psychologically, to grapple with its defence using needs than it had been in 1917. Those needs were recogzed at the start, their co-ordination provided for under the tional defence advisory commission and federal funds were omptly made available.

Of 200,000 new family units needed for workers transplanted to carry t the national defence program, it was still hoped at the end of 1940 t private enterprise would provide more than half. Part of the reinder the army and navy departments were building themselves. The blic Buildings administration of the Federal Works agency was specializ; in demountable houses for temporary developments where there was reason to expect a continued need after the period of emergency. Local using authorities, with the assistance of USHA, were carrying out proms where the developments could be fitted into permanent local needs.

The earliest authorization by congress at the end of June permitted operation of USHA and local housing authorities with either the war navy department, to provide housing for their married enlisted personnel civilian workers out of funds already at the disposal of USHA. This thorization was of special value as a demonstration of speed by already octioning agencies. Several of these projects, built by workers on two ifts, were already being tenanted in December. In early September 00,000,000 for housing was made available to the war and navy departents for the fiscal year 1940–41, while the Lanham act, approved Oct. 14, ovided $150,000,000 more to be disbursed by the Federal Works agency relieve housing shortage impeding national defence industries, the ministrator to delegate the carrying out of these purposes to any propriate federal or local public agency.

About $290,000,000 thus became available from public funds for defence using. To Dec. 18, 1940, allocations had been made for 46,405 dwelling its, of which more than 20,000 were under construction.

Meanwhile, the regular slum clearance and rehousing program under the ited States Housing act of 1937, undertaken by local housing authorities, th the assistance of the United States Housing authority, was passing pidly to the construction and occupancy stages. Although congress had t yet provided for expansion of the program beyond 1938 authorizations, was found possible, by various economies and recoveries, to increase the tal number of dwelling units to be built from 160,000 to about 193,000. fore the end of the year there were loan contracts and earmarkings outnding for the 525 USHA-aided projects in 234 localities in 37 states d territories (excluding army or navy-leased defence housing), with a tal anticipated development cost of $770,170,000.

USHA-Aided Local Authorities' Projects (Dec. 19, 1940)

	Under Loan Contract	*Under Construction*
tal number of projects	489	337
tal number of localities	221	172
tal number of dwelling units	158,234	115,552
erage over-all cost of new housing per unit	$4,382	$4,308
erage net cost of dwellings per unit	2,857	2,717
erage net cost of dwellings per room	679	646

pproved rents and incomes:
rth: Monthly shelter rent per unit $14.77; Annual family income $910
uth: Monthly shelter rent per unit $10.06; Annual family income $651
umber of projects occupied or partially occupied, 125 in 81 communities.
tal number of dwelling units occupied, 35,130.

New York state, operating with its own funds, had under construction ongside the Brooklyn navy yard the largest slum clearance and rehousg operation so far undertaken in the United States, to shelter 3,528 milies.

The city of New York, also acting independently, used the proceeds of special tax to build Vladeck city houses on a slum-cleared site and had her small projects under way.

The work of the Farm Security administration, U.S. department of agrilture, in the field of rural housing during 1940 falls under four heads:) *Rehabilitation Program.* More than 850,000 low-income farm families ere being helped by loans and otherwise to organize their farm operations a more efficient basis. Incident to this program by the end of 1940, about 39,000 sanitary privies had been constructed, 17,900 water supplies protected and 27,350 houses screened. (2) *Tenant Purchase Program.* Loans were made to more than 12,000 tenant farm families to enable them to purchase farms of their own. To June 30, 1940, 5,063 new homes were built in connection with this program and 6,794 existing houses repaired. About 2,900 more new homes were being built during the fiscal year. (3) *Homestead Development Program.* Under the supervision of FSA were 164 homestead developments, intended to give over 15,000 low-income farmers a new start on good land. Ownership was being transferred to the residents as fast as possible. (4) *Migratory Labour Camps.* The purpose is to provide temporary shelter and sanitary facilities for migratory farm labour families. A typical camp consists of a group of community buildings containing washrooms, laundries, showers, toilet and other facilities surrounded by tent platforms, one-room shelters and larger houses. Accommodations for 12,509 families had been provided in 1940. Considerable expansion of these facilities was being planned.

(*See* also CENSUS, 1940; MUNICIPAL GOVERNMENT: *Housing;* UNITED STATES: *Housing;* WASHINGTON, D. C.)

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THE SOUTH SECTION of huge "Parkchester" in New York city was opened in the spring of 1940

Great Britain.—There was an almost complete cessation of house building during the year 1940, both by municipal authorities and by builders who normally produced small middle-class houses on a speculative basis. One of the most important contributory factors was the difficulty of obtaining adequate materials. Most of the basic materials had been taken over for building of a wartime nature and this, together with the shortage of some of them, made private building more difficult almost from day to day. At the end of 1940 there was complete control over all forms of building, and private enterprise was limited to an amount which could be covered by a cost of not more than £500. This regulation alone practically ruled out any form of house building.

Before this last regulation came into force the shortage and control of timber was the main cause of the closing down of house building. Many experiments were made in the use of other materials to take its place—roof construction in small buildings being the chief problem. Although many systems and substitutes were advocated there were very few, if any, which were found to take the place adequately and economically of the customary structural timber used on a small scale.

Added to other difficulties was the need for the provision of accommodation for workers in newly-created industrial areas, and in view of the fact that many of the new industrial areas were likely to exist only during wartime and that accommodation had to be found urgently there was little attempt to link up the satisfaction of this need with any long-term policy in housing.

The Royal Institute of British Architects launched a competition for designs for small houses which would serve a wartime purpose and could be built with wartime materials and which could, when peace arrives, be enlarged or otherwise adapted to normal peacetime living. A number of interesting designs was submitted, many of them of great ingenuity, but the general result gave the impression that the housing of people in a locality of mushroom wartime industries under wartime conditions presented a problem which bore little or no relation to normal times.

The demolishing by enemy action of many of the poorer types of buildings in certain parts of London, tragic indeed as it is, with all its attendant hardships, at least gave encouragement to those interested in the betterment of housing generally to work for something far better and more human to take their place in the future.

The problem of areas which should have been abolished long ago was in many cases solved by the activities of the enemy who cleared sites ready for something finer for the future. (*See* also PUBLIC HEALTH ENGINEERING.) (F. R. Y.)

Houston, David Franklin (1866–1940), U.S. educator, economist and statesman, was born in Monroe, N.C., Feb. 17. After graduation from South Carolina college in 1887 he served there as a tutor for a year, then became superintendent of schools in Spartanburg, S.C. In 1894 he joined the faculty of the University of Texas in the political science department, rising to the rank of president of the university in 1905 after a term as president of the Texas Agricultural and Mechanical college. In 1908 he was elected chancellor of Washington university, St. Louis, holding that post until 1916. In the meantime he had entered President Wilson's cabinet as secretary of agriculture; he was also secretary of the treasury in 1920–21. On his retirement from the cabinet in 1921 he was made a vice-president of the American Telephone and Telegraph company. In 1930 he was elected president of the Mutual Life Insurance company, holding that post until the end of 1939, when he became chairman of the board. He wrote *Eight Years with Wilson's Cabinet* in which he defended the president from attacks made upon his record. He died in New York city, Sept. 2.

Howe, Frederic Clemson (1867–1940), U.S. lawyer, was born in Meadville, Pa., Nov. 21, and was graduated from Allegheny college in 1889. He studied at Halle, Germany, at the University of Maryland law school and the New York Law school. Admitted to the bar in 1894, he practised in Cleveland, Ohio, until 1909. He investigated municipal ownership in Great Britain for the United States government in 1905 and served in the Ohio senate from 1906 to 1909. He became professor in the Cleveland College of Law and lecturer on taxation at Western Reserve university, and from 1906 to 1909 he lectured in the University of Wisconsin on municipal administration. From 1914 to 1919 he was commissioner of immigration at the port of New York. In 1933 he was appointed consumers' counsel for the AAA and in 1935 he was made adviser to the secretary of agriculture. He wrote many books on municipal government, systems of taxation and other governmental subjects. He died in Oak Bluffs, Mass., Aug. 3.

Howland Island: *see* SOUTH SEA AND EQUATORIAL ISLANDS.

Hungary. A kingdom in central Europe, although since the breakdown of the Habsburg monarchy in 1918 the throne has remained vacant. Chief of state was in 1940 the regent, Admiral Nicholas Horthy. While the kingdom of Hungary before 1918 had an area of 125,402 sq.mi. with a population in 1910 of 20,886,487, of whom only a little less than half (10,050,575) were Magyars according to the official Hungarian census, the treaty of Trianon in 1920 separated from Hungary most of the parts inhabited by non-Magyar populations, so that Hungary was reduced to an area of 35,875 sq.mi. with a population of 7,980,143 in 1920. Since 1938 Hungary regained some of the territory lost after the war of 1914–18. She gained from Czechoslovakia through the award of Vienna on Nov. 2, 1938, about 4,630 sq.mi. with roughly 1,000,000 inhabitants, and in March 1939, Ruthenia with about 720,000 additional inhabitants. Finally a second award of Vienna on Aug. 30, 1940, gave to Hungary the northern part of Rumanian Transylvania, with about 2,500,000 inhabitants and an area of 17,000 sq.mi. At the end of 1940, Hungary thus had about 57,000 sq.mi. with a population of 13,500,000.

This territorial aggrandizement of Hungary was achieved entirely under axis protection. Hungary under Prime Minister Julius Gömbös (who died in 1936) had already instituted a semi-fascist regime in her internal affairs; in her foreign policy Hungary leaned more and more towards the axis powers, and in 1939 officially joined the anti-comintern pact and resigned fr the League of Nations. This fascist line in her internal and her foreign policy was continued and accentuated during 19 although parliament continued to function in both its branch the hereditary house of lords and the elected lower chamber. T strong pro-fascist government majority was faced with a no and extremist opposition of several out-and-out National Social groups, which used as their symbol the cross and arrow instead the swastika. The leader of the extreme National Socialis Major Ferenc Szalasi, was released from jail, but his moveme was inferior in importance to the party of Hungarian Renov tion, which was founded by former Prime Minister Imredy a joined by the former minister of defence, General Ratz. The was little difference between the official policy and that of t National Socialist opposition. The official policy insisted upon certain formal independence of Hungary, while the oppositi demanded an acceleration and radicalization of the fascist mea ures initiated by the government. In that situation anti-Semitis officially initiated in 1938 by an open legislation of discriminati against Jews, grew rapidly and the elimination of Jews from t political and economic life of the country was completed 1940. Individual legislative measures followed each other quick and in Oct. 1940 the last vestiges of the former liberal regi disappeared, when the Jewish faith was deprived of its spiritu representatives in the house of lords. The bill made a spec point in declaring that the political, economic and social stat of Hungarian Jews had so fundamentally changed that a rep sentation of their interests was no longer feasible.

In foreign policy Hungary completely followed the line d tated by Germany. She was continually in strained relations wi Slovakia and with Rumania. The Slovakian and the Hungari governments voiced mutual recriminations about the maltrea ment of their respective minorities. As regards Rumania, Hunga pressed claims for the restitution of territory with greater a greater insistence. The annexation of Bessarabia by the sovi union started the ball of Rumanian dismemberment rollin Hungary and Rumania negotiated for several weeks. Hunga demanded the larger part of Transylvania, while Rumania i sisted that Transylvania was predominantly inhabited by R manians and had been the original home of the Rumani national renaissance. Finally Germany and Italy invited t Hungarian and Rumanian statesmen to Vienna, and there Aug. 30, 1940, awarded to Hungary, against violent Rumani protests, the northern part of Transylvania, with the strateg Carpathian border against the soviet union. This settlement w not regarded as definitive either by the Hungarians, who co tinued their claim for all of Transylvania, or by the Rumanian for whom Transylvania was much more an integral part of R mania than Bessarabia or the Dobruja. In spite of Rumani opposition, the Hungarian army, led by Admiral Nicholas Hort on the traditional white charger, started the occupation of Tra sylvania on Sept. 5, which was terminated by Sept. 13. Hunga acquired important timberland and the large cities of Orad (Grosswardein) and Cluj (Klausenburg). The University Cluj, which had been a Rumanian university since 1920, w Magyarized. The newly-acquired territory of Transylvania w be represented in the Hungarian lower house by 63 deputies, whom 44 will be Magyar, 17 Rumanians and 2 Germans; t Rumanian deputies, however, will take their seats in parliame only after a similar treatment has been accorded to the Hu garian minority remaining in Rumania.

On Nov. 20 the Hungarian foreign minister, Count Stephe Csáky, signed in Vienna a protocol by which the country joine the German-Italian-Japanese pact of Sept. 27, 1940, a pact whic represented a revival of the anti-comintern pact concluded amo

e same powers and joined by Hungary already in Jan. 1939. The hesion of Hungary to this pact was announced as the first step a great and inclusive broadening of the pact as the basis of new world order, but in addition to Hungary only Slovakia, a rman protectorate, and Rumania, which had meanwhile become enly a German vassal state, joined. Hungary found herself is reduced to a position of equality with Slovakia and Rumania, d this position became manifest when towards the end of 1940 rman troops moved freely through Hungary into Rumania and wards other Balkan destinations. It was at the suggestion of e axis powers, especially Italy, that Hungary tried to arrive an understanding with Yugoslavia. Count Csáky went at the ginning of December to Belgrade where he signed a treaty of endship with Yugoslavia. (*See* also BALKAN ENTENTE; RUMANIA.) (H. Ko.)

urdling: *see* TRACK AND FIELD SPORTS.

itton, Maurice (1856–1940), principal emeritus of University college of the University of Toronto, was born in Manchester, England. He was educated at orcester college, Oxford. He was a fellow of Merton college, ford, 1879–86. In 1880 he became professor of classics in University college and was made principal of the college in 1891. He nslated Tacitus for the Loeb Classical library and wrote *The eek Point of View* and several other books. He retired in 1928 d died in Toronto, April 5.

e Hockey. It is estimated that nearly 5,000,000 persons saw professional and amateur hockey games in the S. during 1940, and that a total of nearly $8,000,000 went to y for admissions, salaries and new equipment.

The New York Rangers became the world's champions in big-e professional circles by defeating the Toronto Maple Leafs in e final play-off conducted by the National Hockey league. The ngers captured four of the seven principal trophies awarded for rious "bests" to the team or to individual players, including e Stanley cup, the William MacBeth trophy, the Calder trophy d the Georges Vezina trophy. The Boston Bruins, first place nner in the N.H.L., captured the Prince of Wales trophy. hmidt, of the Bruins, led in the league's scoring, with 52 points.

Hockey set a fast pace in the minor (professional) leagues. In e International American Hockey league, the Providence team n in the eastern division, and the Indianapolis team led in the stern division. In the American Hockey association, the St. uis team took the crown. In the Pacific Coast Hockey league, e Vancouver team won premier honours.

The Baltimore Orioles took a six-game lead to capture the title the Eastern Amateur Hockey league and gained possession of e James J. Walker trophy of New York. Other winners in the gue were the New York Rovers, capturing the Atlantic City ardwalk trophy and the Hershey Challenge trophy. Another teworthy feat was the victory of the United States over Canada r the Hamilton B. Wills International trophy, won in a closely ntested series that was decided by one game, the scoring being points for the U.S. team and 24 for the Canadians. In the etropolitan (N.Y.) Amateur Hockey league, the title went to e Exchange Brokers team. The New York Amateur Hockey sociation championship was won by the St. Nicholas Hockey ib.

In the Quadrangular Hockey league, Yale won the championip. The national Amateur Athletic union ice hockey championip was won by the University of Minnesota, defeating the ock-Hall Hockey club in the finals, at Lake Placid, N.Y.

The University of Toronto, capturing the Canadian inter-collegiate crown, led the way in Canadian hockey in 1940, winning the International Inter-Collegiate Hockey league title, one point behind McGill, with Yale third. The Allen cup, emblematic of the amateur championship of Canada, was won by the Blue Devils of Kirkland Lake, Ont., when they defeated the Calgary Stampeders in three straight games. (J. B. P.)

Iceland, island kingdom of northwest Europe, hereditarily united with Denmark, in the north Atlantic ocean, touching the Arctic circle; area, 39,709 sq.mi.; population (1939), 120,264. Capital and only large town, Reykjavik (pop. 1939, 38,219). Language, Icelandic; religion, Lutheran Christian.

History.—An independent and sovereign state since Dec. 1, 1918, Iceland retained connection with Denmark by recognizing Christian X as its king, and by using the Danish diplomatic service when necessary.

In 1940 the Icelandic parliament (Althing) was in session when the Germans invaded Denmark (April 9). That same day the united Althing protected the country's interests by entrusting the executive power to the ministry of Iceland "for the time being," and by declaring that Iceland would care for its own foreign affairs and fisheries inspection. A coalition ministry of five members signs acts of the Althing before they become law, and at least three must agree on any measure taken in the name of the royal power. Iceland had in 1940 appointed chargés d'affaires in London, Stockholm and Madrid, a consul general in the United States and retained its legation in Copenhagen. Diplomatic representatives of Great Britain, Norway, Sweden, Denmark and the United States resided in Reykjavik.

On May 10 British troops landed in Iceland, and a force of 60,000–80,000 was maintained there in order to prevent German use of the island as a base for action in the Atlantic. The British did not interfere with the government or freedom of speech, and the Icelanders, while none too friendly, tried to believe that the British soldiers would evacuate as soon as the war ends. The occupation created social problems among a people only twice as numerous as the garrison itself, but it also stimulated business. Icelandic ships continued to operate and the country sold its entire output of herring meal and herring oil, and the catch of cod, to Great Britain.

Banking and Finance.—Budget est. (1939): revenue, 17,904,960 krónur; expenditures, 16,705,791; (1940): revenue, 18,594,830 krónur; expenditures, 17,857,448. Public debt (Dec. 31, 1938), 47,161,000 krónur, of which 41,281,000 was foreign indebtedness; state assets est. at 75,466,000 krónur.

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(F. D. S.)

Ice Skating. The country-wide popularity of ice carnivals called many of the best skaters from amateur ranks to make up the personnel in the six huge ice extravaganzas which toured the United States. There was a steady growth in the number of skating clubs in all parts of the country, and although skaters in the east used to win all of the titles, 1940 saw California youngsters pluck two big title plums.

The graceful art of figure skating welcomed a new national champion in 1940, Eugene Turner, of Los Angeles. Another coast skater, Miss Ramona Allen, of Oakdale, won the women's national junior title. For two years in succession, Miss Joan Tozzer won the women's national title and paired with Bernard Fox (both of Boston) won the national pairs championship. The national fours title went to the St. Paul Figure Skating club, and the national dance title to Miss Dorothy Glazier and Stephen Tanner, Boston skaters. Miss Maxie Herber and Ernst Baier, the 1936 Olympic figure skating pair, were for the fourth time the champion pair of Germany.

The country's leading speed skater in 1940 was the Olympic champion, Leo Freisinger, of Chicago, who captured both the national and North American championships, winning the races at 220, 440 and 880 yards, and one mile. Miss Madeleine Horn, of Beaver Dam, Wis., won the women's events in both of these skating classics, taking the 440 and 880 yards, and three-quarter-mile events. The Middle Atlantic championships were won by John A. Roukema and Miss Virginia Jahn. The Eastern States titles were won by Ted Ellenwood and Miss Alice Burnham, and indoors by Joe Bree and Miss Marjorie Cummings. (J. B. P.)

Idaho is one of the far northwestern states, belonging to the group regionally designated as the Pacific northwest. It has an area of 83,888 sq.mi. Its peculiar shape has often been commented upon; it has the longest boundary line in proportion to either area or population of any of the states and, with the possible exception of Pennsylvania, is the only state in the union touched by six other states and a foreign country. This fact affects almost every phase of governmental cost.

Population according to the United States census of 1940 is 524,873. Boise is the capital and largest city. (*See* CENSUS, 1940.)

Of the state's population 36·4% is urban. In 1930 there were 437,562 whites, of whom 407,108 were native born; there were 3,638 Indians. In literacy the state was third in national rank and fourth in the preponderance of native born. Figures for 1940 were not available (Jan. 1, 1941) but percentages would be probably not materially changed.

History.—In the presidential election, Nov. 5, 1940, Roosevelt received 127,842 votes and Willkie, 106,553. For the state, there were elected a Democratic governor and a Democratic legislature, while John Thomas, a Republican, was sent to the United States senate. Henry Dworshak, a Republican and Compton I. White, Democrat, represent the two congressional districts. Senator D. Worth Clark, Democrat, was elected in 1938.

Senator Thomas succeeded William E. Borah, whose death occurred in Jan. 1940; Thomas's term will expire in 1942. State officials for 1941–42 were: Chase A. Clark, governor; Charles C. Gossett, lieutenant governor; George H. Curtis, secretary of state; Bert H. Miller, attorney general; Calvin E. Wright, state auditor; C. E. Roberts, superintendent of schools; Arthur Campbell, mining inspector.

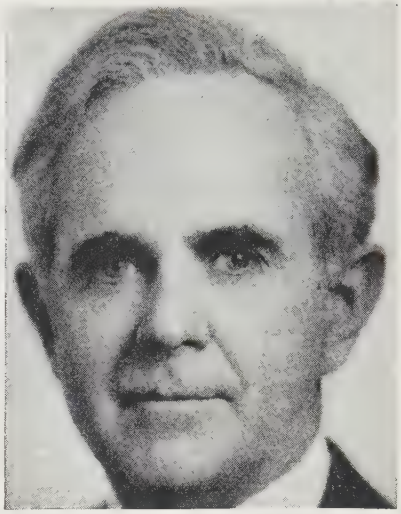
The 26th legislature convened on Jan. 6, 1941. Both houses were Democratic, and apparently in sympathy with Governor Clark's program. The budget, placed before the body, called for materially larger expenditures than during the preceding biennium. Among the important measures pending were those looking to the abolishing of a number of commissions in favour of one-man control. A retail sales tax measure was scheduled to be placed before the legislature in 1941 as an additional source of revenue.

Education.—School population in 1940 was 120,987. There were 86,829 pupils and 3,107 teachers in 1,012 elementary schools. High school enrolment showed unusual gain, there being 34,158 pupils with 1,405 teachers in 183 accredited schools. The state university is at Moscow, with a southern branch at Pocatello.

Normal schools are located at Lewiston and Albion with a newly built junior college at Boise.

Banking and Finance.—On June 30, 1940 there were 18 national and 32 state banks with a capital of $9,506,497, deposits $100,426,727, and total resources $112,991,928. State treasurer's receipts from Sept. 30, 1939 to Dec. 31, 1940 were $59,603,829; balance at close, $5,972,979. The state's assessed valuation was $387,495,500. The state entered 1941 in sound financial condition.

Agriculture, Manufactures, Mineral Production.—Most recent statistics (1935) r[illegible] veal 45,113 farms, valu[illegible] at $307,395,329. Leadi[illegible] crops for 1940 were [illegible] follows: wheat, 24,38[illegible] 000 bu. valued at $1[illegible] 898,000; hay, 2,373,0[illegible] tons, valued at $15,07[illegible] 000; potatoes 32,860,0[illegible] bu., valued at $9,858,00[illegible]



CHASE A. CLARK, Democrat, elected governor of Idaho Nov. 5, 1940

There were 533 man[illegible] facturing establishmen[illegible] with 12,797 workers a[illegible] a total pay roll of $1[illegible] 249,586. In 1940 Idaho[illegible] "big five" metals pr[illegible] duced as follows: go[illegible] 145,000 oz., valued [illegible] $5,075,000; silver, 1[illegible] 235,000 oz. ($12,25[illegible] 000); lead, 207,600,000 lb. ($10,380,000); zinc, 141,300,000 l[illegible] ($9,184,500); copper, 6,700,000 lb. ($757,100).

Since the first discovery of gold in 1860, Idaho has produc[illegible] $170,000,000 of that metal with a total metal output of nea[illegible] $1,500,000,000. (B. DE.)

Illinois, a north central state of the United States, admitted [illegible] the union in 1818, by 1940 census reports has a pop[illegible] lation of 7,897,241, a 3·5% gain over 1930. Springfield, t[illegible] capital (75,503), ranks fifth in population after Chicago (3,39[illegible] 808), Peoria, Rockford and East St. Louis. Greatest gains we[illegible] made in the oil fields by Marion county (34·7%) and Centra[illegible] (29·9%).

More than half of the population is urban.

History.—The death of Governor Henry Horner on Oct. [illegible] 1940, after a two-years' illness, brought to the governorsh[illegible] Lieutenant Governor John Stelle, a keen critic of the Horn[illegible] administration who had himself lost the nomination for t[illegible] office in April. His three months in office saw numerous replac[illegible] ments of appointive officers, among whom were five directo[illegible] of administrative departments.

The heaviest Illinois vote on record (4,262,196 ballots) ga[illegible] in 1940 a majority to Roosevelt for the presidency (Roosev[illegible] 2,149,943; Willkie 2,047,240), but elected from the Republic[illegible] column a U.S. senator, Wayland C. Brooks, to finish the te[illegible] of the late J. Hamilton Lewis; other Republicans elected we[illegible] 16 out of 27 congressmen; all state officers with one exceptio[illegible] and a majority in both houses of the general assembly. In 194[illegible] by federal reapportionment based on the 1940 census, Illin[illegible] will lose one seat in congress.

New state officers (inaugurated Jan. 13, 1941) were Dwig[illegible] H. Green, governor; Hugh W. Cross, lieutenant governor; E[illegible] ward J. Hughes (D.), secretary of state; A. C. Lueder, audito[illegible] Warren Wright, treasurer; George F. Barrett, attorney gener[illegible]

The general assembly convened in special session on April [illegible] 1940, its chief accomplishment being to increase old-age pensio[illegible] to a maximum of $40 a month.

Education.—Public instruction in Illinois is supervised by t[illegible] state superintendent of public instruction, elected for four yea[illegible] in the off-year election. For the year ending June 30, 1939, t[illegible] enrolment (elementary and secondary schools) was 1,272,3[illegible] with a teaching staff of 48,919. School buildings number[illegible] 14,188. Schools are supported by local taxation and a state d[illegible] tributive fund and are administered by some 12,000 school boar[illegible] Of the state's higher institutions of learning, the University

inois in the fall of 1940 had a registration of 14,134, of whom 93 were in Chicago departments. The five state teachers' leges reported a total registration of 7,351.

Public Welfare.—The estimated number of persons depend- on five public assistance programs in Illinois in Sept. 1940 s 952,015, or 12·1% of the population. General relief served 7,846; WPA employment, 357,466; old age assistance, 139,926; thers' pensions, 16,296; blind pensions, 7,627. Maximum old- pensions were increased in 1940 to $40 a month, but the rage payment in September was $21.49. In September persons general relief were paid $5,107,495.56. In the first ten months 1940, Illinois unemployed were reduced by 135,000, although y slightly more than 100,000 were removed from relief lists. Jnemployment insurance benefits July 1, 1939–March 30, 1940, first paid, amounted to $27,522,012 to 276,615 workers. The director of the state department of public welfare, A. L. wen, in July 1940 was convicted of gross omission of duty in nection with the typhoid epidemic at Manteno State hospital 1939. After Bowen's resignation Governor Stelle appointed arles E. Day director of the department.

National Defence.—Chanute field at Rantoul with its air ps technical school was in 1940 midway in a four-year per- nent construction program on which $13,000,000 had already n spent. For the emergency, temporary construction will sup- ment quarters to take care of the 16,000 men per year who l be trained as radio technicians and skilled mechanics. Scott d at East St. Louis, a branch of the school, was also being anded and annexed Jefferson barracks across the river as a ruiting station and ground training school for communications. e war department too has an expansion program for the Rock and arsenal (one of the largest), and let contracts for con- uction of a replacement centre at Camp Grant, Rockford. The 33d division, Illinois national guard, ordered out for a ar's service, was to go into training in February at Camp Peay, ar Tullahoma, Tenn. With a strength of approximately 13,000 s to be supplemented by 23,000 inducted under the selective vice law. Three units of the division were in service in 1940 he 202nd coast artillery corps, Co. B, 192nd tank battalion, l the 106th cavalry; in addition 350 naval reservists were under ining in Chicago preparatory to being sent to sea in January. Paul G. Armstrong was 1940 directing selec- e service in Illinois ough 284 local draft ards. More than 00,000 men registered the state on Oct. 16, l on Nov. 18 the first ota of 828 men was lucted. Fort Sheridan, , and Camp Custer, ch., are the 6th corps eption centres. The Illinois reserve litia, ages 18 to 45, th duties similar to se of the national ard, was being or- nized by proclamation the governor.

DWIGHT H. GREEN, Republican, elected governor of Illinois Nov. 5, 1940

Finance. — For the st 10 months of 1940 e state's revenue receipts were as follows: direct property tax rrears, no tax levied since 1932), $155,906.94; inheritances, ,600,523.24; liquor taxes, $9,612,013.49; insurance fees and taxes, $7,443,298.19; corporation fees and taxes, $3,409,542.38; interest on state funds, $88,956.28; sales tax, $79,658,677.22; public utility tax, $8,332,753.00; motor fuel tax, $37,276,736.07; motor vehicles tax, $19,653,809.00; Illinois Central railroad, $982,000.83; miscellaneous, $7,930,872.53.

Industry.—A survey in Dec. 1940 of the Chicago area (four Illinois counties and Lake county, Indiana) showed industrial employment at the highest level in 11 years, with 9,000 plants employing 540,000 workers. October figures of the Illinois department of labor gave 6,647 industries with 674,484 workers, showing for the sixth consecutive month a better than average increase over a seventeen-year period.

National defence needs had Illinois manufacturing industries in 1940 filling army and navy contracts for steel, diesel engines, caterpillar tractors, telephone equipment, small arms, munitions and other items, including 9,000,000 lb. of canned meat to be supplied by Feb. 1. At Wilmington an $11,000,000 munitions plant and a $14,000,000 loading plant will be built and operated for the government on a cost-plus-fixed-fee basis. Some contracts provided for the expansion of privately-owned plants.

With Illinois leading in soybean production, Decatur has become the centre for processing soybeans and manufacturing by-products and is expanding its plants; others are operated at Gibson City and Quincy. Illinois had an estimated crop of 37,230,000 bu. of soybeans, 17 bu. an acre, both crop and yield being less than the 1939 figure. Rains came too late to repair all damage done to the 1940 corn crop, which is estimated at 321,941,000 bu., 43 bu. to the acre, a decline from 1939 in both yield per acre and total. Apples will yield about 1,876,000 bu., about 31% of a full crop. Coal production in Sept. 1940 was heavier than a year ago by 182,308 tons. Oil production increased until midsummer, when some weeks showed a decreased output. Up to Nov. 15, 1940, nevertheless, 131,530,000 bbl. had been produced as against a total 1939 yield of 94,307,000 bbl. (T. C. Pe.)

Illinois, University of. In the academic year 1939–40, the university had 17,212 persons enrolled in its classes, not including correspondence courses. The 1940 summer session set a new high mark with 4,069 students. In Nov. 1940, enrolment for the first semester of 1940–41 was 14,134. Of these, 12,358 were on the campus at Urbana-Champaign, 1,193 on the campus at Chicago, and 583 in extramural courses being taught in 12 other Illinois cities. Of the enrolment, 1,462 were graduate students, these numbering 1,292 in the graduate school at Urbana-Champaign, and 170 in graduate work in the Colleges of medicine and dentistry in Chicago. Completed during the year were a natural resources building and additions to the library and hospital. At Chicago, an addition to the medical and dental laboratories building was occupied, and work was started to remodel the old college of pharmacy quarters into a student union.

The library is fifth in size among all American universities, and largest of any state university. Total number of items in it in 1940 was 1,583,000. This included 1,158,000 books, 341,000 pamphlets, 3,900 maps and 11,300 pieces of sheet music in the main library and 17 departmental libraries at Urbana-Champaign; and 60,000 books and 10,000 pamphlets in the departments at Chicago.

The 1940–41 university staff for instruction, research, extension, library and administration numbered 2,156 active members. For the 1940–41 year the operating budget was $8,510,806. This included $5,432,500 from tax revenues.

Illiteracy. During 1940, because of wars and upheavals over wide areas of the globe, there was a net loss in the

world's efforts to reduce illiteracy and in similar movements toward popular education. Germany, which before the World War (1914–18) had established a high record in all forms of education, has lost ground during recent years because of concentration on military enterprises which culminated in 1939 in the European war. In Czechoslovakia, Poland, Holland, Belgium, Norway and France there have been such national disturbances because of invasion that education has suffered along with all other public services. China, with the greatest number of illiterates of any nation in the world, has been compelled because of the Japanese invasion to abandon her recent effective efforts to teach the masses to read through a simplified "alphabet" of 1,000 characters. Reports from the Union of Soviet Socialist Republics, where mass education had reduced illiteracy from the 75% of 1895 to less than 30% in 1937, indicate a slowing down in educational programs. Italy, Spain and all the countries of eastern and southern Europe have been too busy with wars and the threats of war to make any concerted national efforts toward popular education and national literacy. India and Egypt still report illiteracy of over 80% of the population. Mexico and other Latin American nations are making heroic efforts to improve the education of their people, but illiteracy in all these countries is still exceedingly high. In Mexico nearly 60% of the population over ten years of age is still unable to read or write.

The United States of America was one of the few countries to continue to make progress in the reduction of illiteracy during the year 1940. A nation-wide effort to teach the whole nation to read and write continued to be the chief item in the vigorous program in adult education of the Work Projects administration. In 1930—the last year for which comprehensive figures are available—the United States possessed 4,283,753 illiterates over ten years of age, or 4·3% of the population of that age. The best record (only ·6% illiterates) was shown by whites of foreign or mixed parentage, native whites having 1·8% illiterates, foreign born whites having 9·9% and Negroes 16·3%. Rates in given states, according to the 1930 census, ranged from Iowa with only 0·8% of its population illiterate to South Carolina with 14·9%. While Negroes still show the highest illiteracy of any large group of the U.S. population, they have made the greatest recent progress. At the time of emancipation in 1863 it was estimated that of the 4,500,000 slaves and "free persons of colour" in the United States less than 5% could read and write; in 1939 the 12,000,000 U.S. Negroes had a literacy rate above 85%. The Work Projects administration reported in 1939 that during six years of intensive effort it had taught 1,300,000 people to read and write. The 1940 census figures will probably show a reduction in illiteracy to about 3% of the population over ten years of age, by far the best record the nation has shown at any time in its history. (E. R. E.)

Illumination: *see* ELECTRIC LIGHTING.
I.L.O.: *see* INTERNATIONAL LABOUR ORGANIZATION.

Immigration.

Governing Law. — Immigration into the United States is limited both qualitatively and quantitively. The act of Feb. 5, 1917 provides for the exclusion and deportation from the United States of aliens who do not satisfy certain mental, physical, moral and economic requirements.

The act of May 26, 1924, known as the quota act, permits only a limited number of immigrants of each of certain nationalities to be admitted to the United States each year for permanent residence. These restrictions do not apply (1) to persons born in Canada, Newfoundland, the Panama Canal Zone, or independent countries of the western hemisphere; (2) to the wives and unmarried minor children of citizens of the United States, nor to husbands of citizens by marriage before July 1, 1932; nor (3)

Number of Alien Registration Schedules Received Cumulative Through an
During the Week Ending Jan. 10, 1941
Grand total 4,741,971

Region and state	No. rec'd in week	Cum. total to date	Region and state	No. rec'd in week	Cum. t to da
New England	1,632	651,740	So. Atlantic (cont'd)		
Connecticut	105	152,664	Maryland	20	36,
Maine	159	45,597	No. Carolina	40	5,
Massachusetts	908	356,028	So. Carolina	4	7
New Hampshire	361	29,485	Virginia	101	9,
Rhode Island	29	52,339	W. Virginia	17	23,
Vermont	70	15,627	East So. Central	71	17,
Middle Atlantic	1,717	1,845,070	Alabama	13	4,
New Jersey	159	270,973	Kentucky	15	4,
New York	1,293	1,212,622	Mississippi	15	3,
Pennsylvania	265	361,475	Tennessee	28	5,
East No. Central	1,515	921,477	West So. Central	692	230,
Illinois	237	319,385	Arkansas	21	3,
Indiana	101	42,220	Louisiana	42	16,
Michigan	647	290,730	Oklahoma	81	6,
Ohio	280	196,214	Texas	548	204,
Wisconsin	250	72,928	Mountain	1,111	111,
West No. Central	8,763	176,288	Arizona	153	30,
Iowa	8,130	24,015	Colorado	99	26,
Kansas	34	16,180	Idaho	139	5,
Minnesota	492	58,584	Montana	576	13,
Missouri	21	42,049	Nevada	33	6,
Nebraska	37	18,601	New Mexico	93	12,
No. Dakota	36	9,902	Utah	13	10,
So. Dakota	13	6,957	Wyoming	5	5,
So. Atlantic	349	143,998	Pacific	5,839	643,
Delaware	10	6,294	California	4,244	526,
Dist. of Col.	10	19,111	Oregon	766	33,
Florida	134	38,218	Washington	829	82,
Georgia	13	4,849			

to school professors or ministers of religious denominations i their families. The Alien Registration act, 1940, requires tha record be made and kept current of aliens in the United Sta All aliens (except foreign government officials and their famil who remain in the United States 30 days or longer must be re tered and, if 14 years of age or over, fingerprinted. The num of aliens thus shown to be in the United States and its territo in 1940 was approximately 4,900,000.

Flow of Immigration. — During the fiscal year ended June 30, 1 208,788 aliens entered the United States and 166,164 departed, exclu of commuters and short-time visitors crossing the international boundaries. Of these, 70,756 left their homes in foreign countries and ent the United States for permanent residence, and 21,461 departed for per nent residence elsewhere. Of those entering for permanent residence, 50 were from European countries, 17,822 from the Americas and 2,480 f Asiatic and other sources; 5,474 came in non-quota as the spouses or m children of United States citizens.

Activities of Immigration Officers. — The administration of the relating to immigration is under the direction of the Special Assistan the Attorney General in Charge of the Immigration and Naturaliza service, Washington, D.C.

Officers of this service passed upon 51,831,025 citizen and alien en into the United States during the fiscal year, of which 50,102,398 across the Canadian and Mexican borders. Immigration officers boa 33,176 vessels and inspected 1,178,617 seamen. Officers of the Immigra Border patrol patrolled 7,895,348 mi. and questioned 987,274 persons. cause of unsettled international conditions the Border patrol was b strengthened still further.

During the period 6,954 aliens were deported from the United States 8,594 aliens who were considered deportable were allowed to depart at t own expense, making a total of required departures of 15,548. (*See* CENSUS, 1940; REFUGEES.) (L. B. S

Imports: *see* INTERNATIONAL TRADE; TRADE AGREEMENTS.

Income Tax.

Extensive modifications were made in the eral income tax laws during 1940. The r for both individuals and corporations were increased, pers exemptions were lowered and a corporation excess profits tax enacted. Federal income tax collections in the fiscal year en June 30, 1940 amounted to $2,121,073,000, or 37·3% of t federal internal revenue and customs. The individual income produced $982,017,000 and the corporation income and ex profits tax, $1,139,056,000.

State income tax collections for 1940 are estimated to h been $345,916,000, or 8·5% of estimated state tax revenues.

Individual Income Tax.—The federal government's indivi income tax consists of a 4% normal tax and a surtax ran from 4% to 75%, applicable to incomes over $4,000 after all ance for exemptions and credits. The Revenue act of 1940, w is applicable to taxable years beginning after Dec. 31, 1939

sed surtax rates on surtax net incomes in all of the brackets n $6,000 to $100,000. The rates on surtax net income in ex- of $100,000 were not changed. A temporary increase in the me tax for purposes of national defence was also imposed for ble years beginning after Dec. 31, 1939 and before Jan. 1, ;. This defence income tax is equal to 10% of the total nor- tax and surtax, with the provision that such increase shall be greater than 10% of the net income remaining after in- e tax as determined without regard to the defence tax.

he Revenue act of 1940 also made significant changes with ect to personal exemptions. Personal exemptions were low- from $2,500 to $2,000 in the case of married persons and ls of families and from $1,000 to $800 in the case of single ons. The credit for dependents and the earned income credit ain unchanged. A credit of $400 is allowed for each depend- The earned income credit, applicable against the normal tax, a rate of 10%, allowable only on amounts of earned income in excess of $14,000, with $3,000 of income considered earned ther or not actually earned. These provisions serve to exempt n federal income taxes single individuals with net incomes of 9 or less and married persons with net incomes of $2,222 or if without dependents.

equirements as to filing federal income tax returns were also nged by the Revenue act of 1940. Under the prior law, no rn was required if net income was below the personal exemp- s and gross income was less than $5,000. Under the 1940 act turn is required from a single person if his gross income is 0 or more, and from married persons if either their separate aggregate gross income is $2,000 or more.

ederal income tax data for 1938, compiled from income tax rns filed in 1939, show that in that year there were 3,048,545 ble individual and fiduciary returns of which 2,995,664 were vidual returns. These data reveal further that 64% of the l net income reported by individuals was received by persons ing less than $5,000 and 94·3% by persons having less than ,000 net income each. On the other hand, due to the operation he exemptions and the progressive surtax rates, 8·3% of the l individual income tax liabilities was reported by persons n less than $5,000 net income and 51% by persons with less n $50,000 net income.

ndividual income was in 1940 taxed in 31 states and the Dis- t of Columbia. In all but three of these the rates were pro- sive, the minimum rates ranging from 1% to 3%, and the imum rates from 3% to 15%. Four additional states taxed icular sources of income at flat rates. Six states in the above groups imposed surtaxes, two of which apply only to income n intangibles and one to income from speculative transactions. h one exception, surtaxes were imposed at flat rates. In no ance, however, did the maximum state income tax rate, includ- both normal and surtax, exceed 15%. As a result of the low- g of personal exemptions under the federal income tax, the onal exemptions allowed by states were in 1940 either at the e or a higher level in 25 states for single persons, in 21 states married persons and in 13 states for dependents.

lthough some states preceded the federal government in em- ing the income tax, more than half of the states imposing it pted it in 1929 or thereafter. Since 1937 no additions have n made to the list of states which tax income. There were cted in 1939 the District of Columbia income tax, which ap- s to both individuals and corporations, and Philadelphia's tax earned income of individuals and unincorporated businesses. se taxes represent the only income taxes imposed in 1940 by l governments in the United States. Philadelphia's tax im- es a rate of 1½% on wages, salaries and other compensation, on net profits of unincorporated businesses, professions or other activities. No personal exemptions or credits are allowed. Deductions may be made for direct expenses incurred in deriving the income. In the case of residents, the tax applies regardless of the source of the taxable income, while in the case of non-residents, it applies only to income derived within the city.

Revisions in state individual income taxes during 1940 included rate increases in Louisiana and Mississippi, extension of the emergency 1% tax in New York through 1941 and repeal of the surtax on interest and dividends in South Carolina. A special feature introduced by the 1940 Louisiana law was an additional tax of 5% on net income in excess of $5,000 derived from certain speculative transactions (sales of unimproved lands, leases of mineral lands, sales of mineral rights, etc.).

Corporation Income Tax.—The federal corporation income tax rates applicable to taxable years beginning after Dec. 31, 1939 were revised by both the Revenue act of 1940 and the Second Revenue act of 1940.

Under the federal tax, a flat rate is applied to corporations with normal-tax net incomes of more than $25,000. Corporations with normal-tax net incomes of $25,000 or less are taxed at lower graduated rates. In the case of corporations with net incomes of slightly over $25,000, the law provides for an alternative tax which is designed to accomplish a gradual transition between the tax on corporations with net incomes of $25,000 and less and the tax on those with net incomes in excess of that amount.

The Revenue act of 1940 increased the corporation income tax rates by 1%. In addition, a defence income tax equal to 10% of the corporation income tax, as determined without regard to the defence tax, was imposed for taxable years beginning after Dec. 31, 1939 and before Jan. 1, 1945. Under the Second Revenue act of 1940, the income tax rate on corporations with normal-tax net incomes in excess of $25,000 was increased by 3·1%. For taxable years beginning after Dec. 31, 1939, the total tax rate, including the defence tax is, therefore, 24% for corporations with normal-tax net incomes in excess of $25,000. For corporations with normal-tax net incomes of $25,000 or less, the graduated rates range from 14·85% to 18·7%.

The Second Revenue act of 1940 imposed an excess profits tax on corporations, liberalized amortization of emergency facilities for defence purposes and suspended the profit-limiting provisions of the Vinson-Trammel act and certain provisions of the Merchant Marine act of 1936.

The Excess Profits Tax act of 1940 applies rates ranging from 25% to 50% to that portion of the excess profits net income of a corporation which exceeds the excess profits credit plus a specific exemption of $5,000. Excess profits net income consists of net income subject to the income tax with certain adjustments, some of which are the exclusion of long-term capital gains and losses, and the deduction of the amount of the income tax and dividends received. The excess profits credit is equal to 8% of invested capital (equity invested capital plus 50% of borrowed capital) or 95% of excess profits net income for the base period 1936–39, whichever the taxpayer may elect. Provision is made for the exemption of all corporations exempt from the income tax as well as certain other types of corporations. The act contains special relief provisions which are intended to take care of abnormalities in income in the taxable period. Classes of income which may be considered abnormal are specified. In addition, a general relief provision grants to the commissioner of internal revenue authority to make such other adjustments as may be necessary to adjust abnormalities affecting income or capital.

Special amortization allowances have been made under the Second Revenue act of 1940 for emergency facilities necessary for national defence. Upon certification of the advisory commission to the council for national defence and either the secretary of war

or the secretary of the navy, the amortization of certain facilities may be spread over a period of 60 months (or less if the emergency period ends in less than 60 months). This deduction is to be in lieu of the regular allowance provided for exhaustion, wear and tear, and obsolescence in the internal revenue code.

General corporation income taxes are also levied by 32 states and the District of Columbia. One additional state restricts its corporate tax to income from intangibles. Six states impose graduated rates, the minimum rates ranging from 1% to 3% and the maximum rates from 5% to 8%. The other 27 states and the District of Columbia impose flat rates, ranging from 1½% to 8%. Rates of 2%, 4% or 6% are most frequent. During 1940 rate increases were made in Louisiana and Mississippi.

Preliminary federal income tax statistics for 1938 show that 520,500 corporations filed income tax returns for that year, of which 169,885 reported net incomes and 301,146 reported deficits. The remaining 49,469 corporations were inactive during the year. The aggregate net income of the corporations reporting net incomes was $6,525,988,940; the total deficit of the corporations with no net income was $2,853,093,270.

The classification of corporations by the size of their net incomes for 1938 was not available in 1940. In 1937, only 13·3% of the total net income corporations reported net incomes in excess of $25,000. The corporations in this group, however, accounted for approximately 93% of the total net income and paid approximately the same percentage of the total tax. (*See* also LEGISLATION: *Federal;* TAXATION.) (R. BL.)

British Empire.—Owing to the war the income tax position in the United Kingdom was again for the year 1940–41 affected by the introduction of a second budget.

Under the Finance act, 1940, the income tax rate was raised to 7*s*.6*d*. in the £. No change was made in the surtax rate on incomes over £2,000, which ranged from 1*s*.3*d*. in the £ to 9*s*.6*d*. in the £ on any excess over £30,000. Reductions in certain allowances, such as the personal and child allowances, and the earned income, reduced rate and age reliefs, came into force under the terms of an earlier finance act.

The Finance (No. 2) act, 1940, raised the income tax rate for the whole of the year 1940–41 to 8*s*.6*d*. in the £. The surtax on incomes over £2,000 was raised to rates ranging from 2*s*. in the £ to 9*s*.6*d*. in the £ on any excess over £20,000. Further adjustments were made in certain of the allowances to individuals, and a scheme was introduced under which income tax was in future to be deducted at the source from wages and salaries.

The exigencies of the war situation led to a vigorous discussion in the press of various new fiscal proposals. J. M. Keynes pointed out that a reduction in the production of goods for civilian consumption, coupled with a rise in money incomes, especially amongst certain classes of wage-earners, would necessarily lead to inflation unless some method were found of withdrawing the surplus purchasing power from the market. As an alternative to exceptionally heavy taxation he propounded a scheme for compulsory savings on a graduated scale according to the individual's income and family responsibilities, repayment to be made by instalments after peace had been declared, when the additional purchasing power so released would serve a valuable function in tiding the industrial machine over the transitional period when economic disturbance would otherwise be at a maximum. The scheme had a mixed reception, but led to a wider recognition of the necessity for reducing civilian consumption in order to maximize war production. Subsequent unofficial proposals included a tax on excess war income—to correspond to the excess profits tax on businesses—and a substantial reduction in the lower limits of the ordinary income tax. Much ingenuity was expended on these and other schemes, but only time could show to what extent they would commend themselves to chancellor of the exchequer, who was in the best position judge their relative merits.

The increases in the rates of United Kingdom income tax been paralleled by a similar movement in Eire, the domin and colonies. The outbreak of the war resulted in an al general increase in tax rates and reduction in the reliefs gra to individuals, and a number of colonies introduced an inc tax for the first time. As the war continued the early incre in tax rates proved to be inadequate, and a second wave of creases had by the end of 1940 in most cases brought the r to substantially higher levels than were in operation in the war period. (H. E. A. C)

India, a sub-continent projecting from the mainland of A lies between the 8th and the 37th degrees of N latitude. It comprises 11 major or "autonomous" provin five minor areas directly administered by the central British ernment, and a large number (between 500 and 600) of st under Indian rulers. The latter are scattered about the continent and vary greatly in size and importance, as well a the powers enjoyed by their chiefs. British India (the 16 m provinces and minor areas) has its capital at Delhi and is u a viceroy and governor-general (the Marquess of Linlith since April 1936), who is also the representative of the crow its relations with the states. The total area is 1,575,107 sq of which the native states and agencies total 712,508 sq.mi.; (est. 1938) 362,828,000. Chief towns (pop. census 1931): cutta (1,485,582); Bombay (1,161,382); Madras (647,2 Hyderabad (466,894); Delhi (447,442); Lahore (429,7 Ruler, George VI, emperor; languages, Hindi, Bengali and U the most important; religions, Hinduism (approx. two-thir Mohammedan (approx. one-fifth).

History.—So far as it was not, for the great mass of its pe exclusively engrossed in daily toil, India during 1940 was ma exercised by political campaigning and the European war. tween the two an unhappy relation had been established by refusal of the national congress to participate in any war ef and indeed by its threat to institute passive resistance, un the British government gave a guarantee of India's imme independence. To this demand the viceroy (Lord Linlithg speaking at Bombay early in January, gave a reasoned and ciliatory reply. The British government's objective for India explained, continued to be full dominion status of the sta of Westminster variety; the government would be ready consider a revision of the existing constitution, as soon as p ticable after the war, with the aid of Indian opinion; government was prepared at once to bring representative p ical leaders into the governor-general's cabinet; and it w give every help in overcoming communal difficulties in the of Indian unity. He appealed to the leaders of the great polit parties to get together and co-operate in ending the deadl Two days later the president of the congress issued a staten that his party would accept nothing less than complete i pendence for India; his working committee following wit denial that Indian freedom could exist "within the orbit of Bri imperialism." Mohandas Gandhi, who had at first seen in viceroy's speech "the germ of a settlement honourable to b sides," soon began to vacillate. Although he expressed his de tation of Hitlerism and declined to be hustled into a mass m ment of passive resistance, still he saw no prospect of peace u "India is as free a country as Britain." Ultimately he endo the more extreme pronouncements of the congress, commit himself to the assertion that the vast majority of his pe "make no distinction between Naziism and the double autoc

FIRST DETACHMENT of Indian troops arrived in France early in 1940 n the ill-fated British expeditionary force there

rules India." Disclaiming any desire to embarrass Britain, ontributed the following sentiment to its cause: "Let Hitler Mussolini take possession of your beautiful island, your es and allow yourselves to be slaughtered, but refuse to allegiance to them."

leanwhile the other dominant interests in India had not been it. The Moslem league, through its president, M. A. Jinnah, ted that in any revision of the constitution there should be quate safeguards for co-religionists, and categorically re- ed the demands of the congress as meaning nothing but du rule. The princes in conclave declared that they would lad to see India become a dominion under the British crown, only if accompanied by guarantees for the sovereignty of r states and the protection of their treaty rights.

n August the viceroy and L. S. Amery, who had become etary of state for India in the British government, made a erted effort for a settlement. The governor-general's cab- would at once be enlarged by the inclusion of representative an leaders with definite portfolios, and a War Advisory coun- would be set up; while at the end of the war a representative y would be entrusted with the devising of a new constitution. British government, however, was not prepared to transfer esponsibility "to any system of government whose authority directly denied by large and powerful elements in India's onal life." The congress lost no time in totally rejecting e proposals; The Moslem league welcomed them, but renewed earlier idea of partitioning India and creating independent hammedan states in the northwest and eastern zones where m counts most of its followers. The position at the close of stood that congress, at Mr. Gandhi's insistence, issued a ifesto on Sept. 15 withdrawing any conditional offer of co- ation with Great Britain in the war, but promising to restrict ive resistance to the minimum required "for preserving the ple's liberties," whatever this might mean. A fortnight later comment of the Moslem prime minister of the Punjab upon was: "Mr. Gandhi's demand amounts to this, that while ain is engaged in a life and death struggle against Hitlerism hould be given freedom to stab her in the back."

he impasse thus continued. It had apparently done the gress no good, as the number of enrolled members of that y is said to have fallen from 4,500,000 in 1938–39 to under 0,000 in 1939–40. On the other hand, the Moslem league had roved its position. It had less of the schism and indiscipline which Mr. Gandhi laments in the congress; and it had gathered strength from the attempts of the congress to seduce its followers, as well as by raising the old cry of Islam in danger. The princes also were arriving at greater unity among themselves, and the prospects of a constituent assembly threshing out an agreed constitution for the country were far from rosy.

India's War Effort.—Hampered though it was by the intransigence of the congress, the war effort of India was steadily gaining momentum. Public opinion in the country, when it had not been decked out for public purposes, was unanimous against Hitlerism. "Where," to quote the Punjab premier again, "will India stand? On the one side are the forces of irreligious tyranny and oppression, on the other are justice and freedom. There is no room for vacillation or doubt." Men, materials and money were steadily pouring in to the support of the British cause. The princes, faithful to their traditions, had taken the lead, practically offering their all. That trusting neighbour, the Maharajah of Nepal, sent 8,000 of his own troops to help in garrisoning India while its forces were required elsewhere. The Indian army, including 16 units from Indian states, had already been serving from Malaya to France, and 100,000 men were added to it, the training of Indian officers being correspondingly expanded. The air force was quadrupled, and a volunteer reserve, created mainly for coast defence, was overwhelmed with entrants. The royal Indian navy grew out of all recognition. In addition to the old escort vessels it included in 1940 a large fleet of anti-submarine craft, minesweepers and patrol boats; and the personnel was two and a half times as strong as it was before the war. It rendered valuable help to the royal navy in securing the safety of the Red sea route to the middle east, and no less than 71 troop and military supply ships proceeded from Indian ports to their destinations during the first 12 months of the European war, without a single casualty.

Gifts of money ranged from the princely donations of the states to innumerable offerings from all classes, and for all purposes, from the purchase of Spitfires to the relief of air-raid sufferers. But it was chiefly in material supplies that India's power would be felt. Its geographical position and its great reserves of raw materials and labour enable it to supply the necessities of war throughout the Red sea littorals, the Mediterranean, the Indian ocean and elsewhere, thus setting free, for use in other directions, Britain's resources, especially shipping. At the end of 1940 India was in a position to supply 90% of its own war requirements—rifles, machine guns, and artillery up to 6-inch guns and howitzers, as well as saddlery, clothing, etc. In July it was disclosed that the ordnance factories were working 22 hours a day. Besides this measure of self-sufficiency, India exported large quantities of metal and leather products, textiles, machine tools, foodstuffs and oilseeds. Some typical cases will serve as examples: army boots came to the United Kingdom at the rate of 125,000 pairs a month; pig and foundry iron at the rate of 50,000 tons a month; and—most spectacular of all—orders were completed for 1,000,000,000 sandbags, enough if laid end on end to reach to the moon and back. The productive power which this effort called into existence will have a profound influence on India's future as an industrial nation when peace is restored. Meanwhile, to ensure its efficiency, a conscription ordnance required the recruitment of about 1,000 European British subjects to be available for special technical duties in connection with war supplies. A suggestive comment on the growing importance of industrial India was the meeting of the Eastern Group conference at Delhi in October. The conference was attended by representatives of the British dominions from Ceylon down to Australia on the one side and South Africa on the other. It dealt exclusively with war supply problems, and its object was the settle-

ment of a joint war supply policy for the eastern group of the commonwealth in which the maximum use could be made of each existing and potential capacity of the participants for the supply of force and materials in the eastern Mediterranean and all areas east of Suez.

Domestic.—Behind the façade of politics and war effort the ordinary life of the country was uneventful. The provinces in which the cabinets had, at the instance of the congress, refused to function were administered without trouble by the governors and their official advisers. Communal strife abated and endeavours to foment labour troubles were less successful. For these results the improvement in trade, reflected in an unexpected improvement in the railway and postal revenues, and a substantial rise in agricultural prices were in a considerable measure responsible. The government also took action against some of the communist leaders, including S. C. Bose, who was president of the congress in 1939 and founder of the extreme forward bloc.

In Ajmer-Merwara there had been a failure of crops which necessitated certain famine relief measures during the year.

In Bengal the future of the permanent settlement was becoming a critical issue. It is an arrangement, now 150 years old, by which the landlords pay a fixed revenue to the government, whatever may be their takings in rent, in contradistinction to the rule in other provinces where the government of India obtains by periodical revisions a moderate share—rarely over half—of the rental yield. This yield in Bengal today (1940) is estimated at £9,750,000, and the new provincial government, pressed for funds, would gladly recover more than the £4,000,000, which under the permanent settlement is all that they recover from the landlords. A commission, over which Sir Francis Floud was sent from England to preside, reported on the problem: the majority advise the buying out of the landlords and placing the tenants in direct relations with the government. The scale of compensation will be a matter of much controversy and difficulty.

(ME.)

Education.—Recognized institutions in British India (excluding Burma): primary (males): schools 160,545, scholars 7,755,656; (females): schools 31,699, scholars 2,468,632; secondary (males): schools 11,731, scholars 2,005,031; (females): schools 1,325, scholars 282,841. Colleges (males): number 306, scholars 110,022; (females): number 40, scholars 6,593. Universities: British India 15, native states 3.

Banking and Finance.—Revenue, central government (est. 1939–40) rupees 1,21,79,96,000; expenditure, central government (est. 1939–40) Rs. 1,21,76,79,000; public debt (Mar. 31, 1939): domestic Rs. 7,36,42,00,000; public debt (Mar. 31, 1939); external Rs. 4,69,14,00,000; notes in circulation (Feb. 23, 1940) Rs. 2,24,93,68,000; gold and sterling reserve (Feb. 23, 1940) Rs. 1,57,91,57,000; currency: 1 rupee (rs. 1)=1*s.*6*d.* at par; average exchange rate (1938) Rs. 1=17·94 pence.

The heavy drain which the war will impose on the Indian revenues is abated by two fortunate circumstances. In the previous year there had been a distinct return of prosperity, which among other things left a budget surplus in 1939–40, and an arrangement had been reached with the British treasury which accepted for Great Britain a much more generous share of India's military expenditure, especially for duties outside India, than was previously the practice. Consequently the budget for 1940–41 was balanced by only two small increases in taxation: the excise on sugar being raised from Rs.2 to Rs.3 a cwt., and the duty on motor spirit from 10 annas to 12 annas a gallon.

An excess profits tax was to be in operation by the end of the fiscal year and would materially assist future revenues. In June a defence savings scheme started, which offered: (1) ten-[illegible] defence certificates with a tax-free yield of $3\frac{1}{8}$% on matur[illegible] (2) six-year 3% defence bonds, with a redemption bonu[illegible] 1%; and (3) a three-year interest-free loan for subscribers [illegible] religious objections to taking profit from war loans.

The credit of India remained high and its exchange stable. [illegible] government was successfully repatriating its sterling debt, [illegible] owing to the rise in the world price of the white metal it [illegible] able to sell about 65,000,000 ounces of its surplus silver st[illegible] to the bullion market without depreciating the value of the si[illegible] hoards which represent the savings of the rural population.

Trade and Communication.—Overseas trade 1938–39: [illegible] ports, merchandise Rs.1,52,32,76,888; exports, merchandise R[illegible] 62,79,16,269; re-exports, merchandise Rs.6,42,35,626; gold [illegible] silver coin and bullion, imports Rs.2,77,77,737; exports Rs. [illegible] 09,08,106; imports from Afghanistan Rs.2,48,95,446; export[illegible] Afghanistan Rs.50,70,332.

Indian Imports and Exports 1938-39

	Imports from Rs.	Exports to Rs.
U.K.	46,49,10,194	55,51,13,129
Burma	24,34,90,923	10,03,36,903
Japan	15,41,33,950	14,59,02,043
Germany	12,92,72,979	8,55,48,779
U.S.A.	9,77,82,601	13,87,91,101

Communications and transport: Roads (1937) British In[illegible] only, 69,000 mi. metalled, 200,000 mi. unsurfaced. Railw[illegible] (1939) mileage open to traffic, 41,134, of which 29,744 mi. [illegible] government owned. Shipping, tonnage entered (monthly a[illegible] age 1939) 924,200; tonnage cleared (monthly average 19[illegible] 917,500.

Motor vehicles licensed (March 31, 1938): British In[illegible] 97,872 cars and taxis; 39,172 commercial vehicles; 9,385 mo[illegible] cycles, including scooters and auto-wheels. Wireless receiv[illegible] set licences (April 30, 1939) 73,698.

Telephones (March 31, 1939): 79,420 straight-line con[illegible] tions, 601 exchanges.

Indiana. A north central state of the United States, popul[illegible] known as the "Hoosier state." Indiana was admit[illegible] into the union Dec. 11, 1816; that day of the year is now [illegible] served as Indiana day. According to the state *Handbook* [illegible] *Geology* (1922), the land surface is 36,045 sq.mi.; rivers [illegible] small lakes cover 280 sq.mi. and the southwest corner of L[illegible] Michigan 230 sq.mi., making a total of 36,555 sq.mi. U[illegible] Topographical Survey maps in process of compilation and p[illegible] lication will doubtless show some variation from these figures.

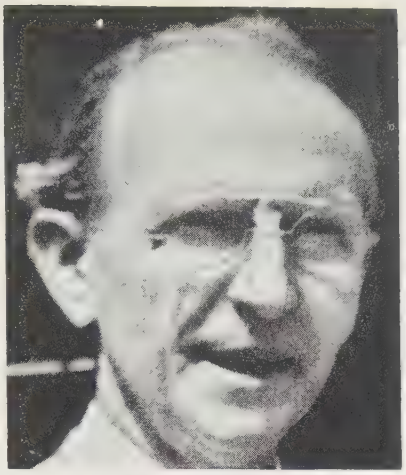
The population of the state, according to the final figures [illegible] the census of 1940, is 3,427,796. There are 92 counties [illegible] 1,016 government townships in the state. Principal cities w[illegible] their population are Indianapolis, the capital, 386,972; F[illegible] Wayne, 118,410; Evansville, 97,062; Gary, 111,719; South Be[illegible] 101,268; Hammond, 70,184; Terre Haute, 62,693; East Chica[illegible] 54,637; Muncie, 49,720; Anderson, 41,572.

History.—Wendell L. Willkie, native-born Republican pr[illegible] dential candidate, carried Indiana in the November election b[illegible] vote of 899,466 to 874,063. Henry F. Schricker, Democrat, h[illegible] ever, was elected governor by a vote of 889,620 to 885,657. [illegible] Republican party increased its majority in the state house of r[illegible] resentatives and won a majority in the senate. It elected, a[illegible] Charles M. Dawson, lieutenant governor; James M. Tuck[illegible] secretary of state; Richart T. James, auditor; James M. Give[illegible] treasurer; Clement T. Malan, superintendent of public instr[illegible] tion. One Republican was elected to the supreme court, and [illegible] to the appellate court, but both courts have a Democratic m[illegible] jority. Raymond E. Willis, Rep., was elected to the seat in

ted States senate held Sherman Minton, the nocratic contestant.

Iational Defence Proj-

.—Federal enterprises he state bulked large. program of national ence resulted in suc- sive geometrical ex- sion of the Allison gineering company, a ision of General Mo- in Indianapolis. By cember orders for the uid-cooled aeroplane ines produced there alled $234,522,000. new International rvester company plant Indianapolis and the Diesel Engine company at Columbus e expanded. The highest number of men employed in the e in making engines in 1937 was 914; as early as Oct. 1940, re than 8,200 were so employed. The estimated number of sons employed in the Allison plant alone at the end of the r was over 13,000. The next development of the defence gram, in point of time, and the most spectacular was the lding of a $50,000,000 powder plant by the Dupont company th of the Ohio river near Charlestown in Clark county, en- sed by a 17-mi. fence. Approximately 13,000 men were ployed there by December, incidentally creating serious diffi- ies in housing, transportation and local government.



HENRY F. SCHRICKER, Democratic governor of Indiana, elected Nov. 5, 1940

At Union Center in La Porte county an ordnance plant devoted efly to shell loading was begun, known as the Kingsbury lnance plant; 13,000 ac. were acquired and approximately 00 persons were to be employed in construction. North of dison, in Jefferson, Ripley and Jennings counties, a tract 17 long, between 3 and 6 mi. wide, embracing some 60,000 ac. s designated for an ordnance proving ground, and the pur- se of the land was begun in December. Forty-eight square es near Burns City in Martin county, chiefly submarginal d, much of it already acquired by the government for a federal est, were allotted to a naval ammunition depot for the Atlantic t; plans for it will make it the largest in the world. An army base, also, was put under way at Fort Wayne.

Banking and Finance.—June 30, 1940, there were in the state state and 125 national banks, a total of 507 (a decrease of e, as compared with 1939) with a total capital of $110,274,405 increase of over $6,000,000). Principal assets and liabilities re general market bonds held, $62,631,917 (a decrease); ns and discount, $318,695,830; state, county and municipal nds, $55,606,478; U.S. government securities, $258,207,462 decrease); total cash and balance with banks, $367,890,749; ings deposits, $280,905,503; demand deposits, $611,466,893, increases except as indicated, as compared with 1939.

The total revenue receipts of the state of Indiana for the year ding June 30, 1940 were $93,540,696.40, including: from gross ome tax $23,538,224.85; from gasoline tax $24,565,328.59 d from property tax $5,481,645.54. State funds distributed to al units amounted to $41,532,597.05, the largest items being schools and roads. Federal aid to all units in the state and tributions for unemployment compensation during the fiscal ar 1939–40 amounted to $33,480,690.72; total property tax, units, $100,303,087.36; total revenue receipts exclusive of te distributions, $195,990,694.65; grand total revenue receipts, units, $245,504,956.29. Total gross disbursements by the state in the year ending June 30, 1940, were $160,840,117. Unemployment compensation benefit payments for the year were $9,289,717.48. Total government payments, all units, were $205,162,390.63 for 1939–40.

Agriculture and Mineral Production.—Unless otherwise specified, figures are for the year 1939, the latest available, and were (Jan. 1, 1941) not final. Total harvested acreage 46 crops, 9,845,800 (1938—10,263,800); total farm value of 66 crops, $180,188,000 (1938—$140,727,000); cash farm income and government payments, $274,203,000 (1938—$269,912,000). Corn production, 213,416,000 bu.; wheat production, 28,449,000 bu.; oats production, 25,225,000 bu.; soybeans production, 13,962,000 bu.; rye production, 1,608,000 bu. The 1940 production had not been tabulated by Jan. 1, 1941 but ran below the figures for 1939. Estimated total of cattle on farms Jan. 1, 1941, 1,748,000; estimated number of hogs on farms, 4,180,000—both increases.

Principal mineral resources are bituminous coal (between 15,000,000 and 30,000,000 tons extracted each year by strip and shaft mining) lying chiefly in the west and southwestern part of the state; limestone in Owen, Lawrence and Monroe counties; clay used in paving and building brick; sand and gravel (which are largely responsible for the fine road system of the state); petroleum, in which southwestern Indiana witnessed a boom during 1939 and 1940.

Manufacturing, Transportation.—Manufacturing has far outstripped agriculture in the number of men employed and the production of wealth. Indiana ranked first in the states in making iron and steel from crude ore (Gary and the Calumet region); the largest fruit jar factory of the United States is at Muncie; the largest petroleum refinery at Whiting, the largest automobile tire inner tube factory at Indianapolis. Indianapolis, Fort Wayne, Evansville and South Bend have extensive and varied manufacturing plants, including pharmaceutical products, gasoline engines, automobiles, farm machinery, chains and saws.

Railroad mileage remained substantially the same. Electric interurban mileage was further decreased, the only lines remaining at the end of 1940 were those of the Indiana railroad, Evansville and Ohio Valley, Chicago, South Shore and South Bend. Rural electrification along the former interurban lines was supplemented by some two-score rural electrification projects. Less than 100 mi. of hard road were added to the state highway system in 1940, but transportation by trucks and buses continued to increase. Among the approximately 50 airports operated in the state, the municipal airport at Indianapolis was greatly expanded and supplemented by the federal experimental station and an aeronautical school. (C. B. C.)

Indians, American. On April 24, 1940, representatives of 19 of the 21 American republics met together at Patzcuaro, Mexico, for the First Inter-American Conference on Indian Life. Of the nations with appreciable native populations, Canada alone was unrepresented. For the first time in history consideration was given to the social, political, educational and physical welfare of the 30,000,000 Indian inhabitants of the western hemisphere. In addition to official delegates, native Indian representatives from many of the nations also attended. A conference action which may be of far-reaching significance was the creation (subject to ratification by five governments) of a permanent agency for inter-American co-operation on behalf of Indians.

On Oct. 16, 1940, for the first time since the Indians of the United States were granted full citizenship (1924), the nation called upon them for co-operation in national defence by enrolling under the Selective Service act. Despite generous participation by Indians in the American armed forces during the

war of 1914–18, several of the tribes remained in 1940 technically at war with the United States. Indian enrolment exceeded 99% of the estimated eligibles even among the non-English-speaking groups. Large numbers of young Indians also were, in 1940, members of the national guard in their respective states and many volunteered for the armed force without waiting to be called.

Despite the reluctance of congress to arrive at any settlement of the Indian claims issue involving millions of dollars for lands taken from numerous tribes, the adjustment of two large claims in which the Indians won their cases before the court of claims was under way. The sum of $4,599,987.02 was distributed to the Shoshone of the Wind River reservation in Wyoming, and $5,598,-635.43 to the Klamath of Oregon, under legal restrictions agreed to by the tribes which limited the use of funds to land purchases, home building and similar items of economic reconstruction for the individuals concerned.

After six years of activity under the Indian Reorganization act, 250 of the eligible tribes or groups accepted the act, of whom 132 were in 1940 chartered and were making active use of credit and other provisions of the act. Proposals for amending the act to correct some of its revealed weaknesses were pending before the congress.

However, the growing emphasis on national defence resulted in a substantial decrease in appropriations for Indian rehabilitation which affected adversely the land purchase program, rehabilitation housing, the completion of projected irrigation development for the better use of Indian resources, and other constructive efforts to provide Indians with the means and opportunity to attain economic self-sufficiency.

During the year the soil conservation activities on Indian reservations were transferred from the department of agriculture to the department of the interior and became a function of the Indian service. Past neglect and overgrazing of Indian lands have contributed seriously to the depletion of Indian economic resources and the move may be of considerable importance.

Research by the medical division of the Office of Indian Affairs over a period of years resulted in the announcement in 1938 that trachoma is a virus disease and experimentation with sulphanilamide and neoprontosil as specific in 1939 and 1940 were most encouraging. The solicitor's office of the department of the interior completed during the year a major task in the preparation of a compendium of federal laws and treaties relating to Indians, the first complete survey of this complicated subject. (W. W. B.)

Indo-China, French: *see* CHINESE-JAPANESE WAR; FRANCE; EUROPEAN WAR; FRENCH COLONIAL EMPIRE; JAPAN; SIAM.

Industrial Research.

In the United States during 1940 metallurgy, agricultural and organic chemical technology, petroleum and synthetic textiles, rubber and resins were the dominant fields of industrial research. British, German and soviet investigations were concerned especially with metals, coal and petroleum products, paints, plastics and foods. In Italy motor fuels, chemicals, explosives and textile fibres, and in Japan hydrocarbons, solvents, cellulose products, synthetic rubber and marine and vegetable oils were the main subjects of research.

United States.—The total expenditure for basic production research in the United States in 1940 was probably $220,000,000. A nation-wide study was started by the Air Hygiene foundation in attempting to reduce the estimated $900,000,000 a year lost to the industries by workers absent because of illness. The speed-up of production increases the hazards which result in many types of accidents and maladies. In a non-explosive coal-mining process a tube placed in a hole drilled in a vein expands whe under high pressure is pumped into it. The bureau of mine ported on the hydrogenation of low-rank coals from the we satisfactory substitute for mica is needed and "Alsifilm" wa ing tried in lieu of mica splittings. A procedure of expl for metal-bearing ores is based on the observation that p growing over an ore body contain more of the metal in thei sues than plants from other places. American clays have disp imported clays for many uses. "Duraglass" is a stronger b glass produced by automatic control; figured wire glass is m with chromium-plated wire. Valuable increases were report the light transmission of optical systems produced by sui chemical treatment, such as with 1% nitric acid solution, to low refractive index surface films; by following this pr with a baking operation the glass surface is made much more able. "Vycor" laboratory ware, which is 96% silica glas practically shockproof thermally; "Pyrex" highway refle markers were pronounced successful by New York state gineers. Several new laboratories for powdered metals rese were established. "Plast-iron," a pure iron powder, was nounced. The National Bureau of Standards studied the rosion of metals used in aircraft. The casting of rods and t from molten metal is performed continuously; wire is made process of slitting sheets instead of drawing metal through The reduction of iron ores under pressure by carbon mon and the desulphurization of pig iron with calcium carbide investigated. The output of information of all aspects of we continued. Uranium-nickel steels appear to be quite corro resistant; silver-bearing 18/8 stainless steel is much more sistant to chloride solutions than the original alloy. The us polonium in standard electrode alloys was found to improve starting performance of spark plugs. Tellurium was empl in a new electric lamp. By an electrolytic process both pl with indium and its production in commercial quantities possible. It is expected electrorefining of tin will attract attention in the future. By the middle of 1942 the produ of aluminium ingots will have expanded to 250% of the level. Advances were made in the knowledge of beryll aluminium and beryllium-magnesium alloys. Magnesium pro tion was 13,000,000 lb. in 1940 and will be doubled by spring of 1942.

New processes were introduced for the stabilization of io in iodized carriers. A molten mixture of salts consisting of so nitrite and sodium and potassium nitrates is a heating cooling liquid for industrial processes requiring high temp tures, but where direct heating with an open flame is either gerous or impracticable. The net cost of research in the of synthetic organic chemicals was about 3½% of sales. Nitrom ane, nitroethane, 1-nitropropane, and 2-nitropropane were b manufactured commercially, and later on nitro-paraffins longer carbon chains will be available. Over 80 commercia esters of polyhydric alcohols and their ethers were repo Normal octanol and normal decanol were available in quan the manufacture of adipic acid was started. The productio guanidine salts was markedly improved. Levulinic acid was commercially. New non-volatile, water-soluble compou offered under the designation "Carbowax," were recomme for the paper and textile industries and as metal-working Sulphathiazole, sulphadiazine and sulphaguanidine are new m bers of the sulphanilamide family. Drug manufacturers reported to be studying hydroponics for growing drug pl produced only in the orient and for raising the drug conte plants. The four regional laboratories of the U.S. departme agriculture were made ready for occupancy. Potassium m phosphate was described as a potential high-analysis fertil

erial. Better extraction of cottonseed oil was being studied; ns were being sought to produce furfurol from cottonseed s and to use the residual lignin for the production of a plastic. es for plywood from cotton and soybean proteins were being eloped. Colchicine continued to get attention as an inductor polyploidy in plants. Applied in the form of a solution con- ing as little as one part in 100,000,000 parts of water, vitamin was reported to have displayed potentiality in horticulture. rmone" is a "liquid hormone spray" containing naphthalene ic acid, for use in delaying the dropping of fruit from trees l they are ready to harvest. Bactericidal irradiation was put vider use and the characteristics of the "Sterilamp" were re- ed. Food dehydration was being studied broadly. There was siderable activity in research on food antioxidation. A new thetic sausage casing consists of collagen; cholesterol was being luced commercially from beef spinal cords. The growth of re- ch effort in the petroleum industry has been rapid, having nded 539% in 11 years and having risen from seventh largest econd largest. The National Advisory Committee for Aeronau- selected Cleveland, O., as the site for the government's 00,000 aeroplane engine research laboratory. Geochemical pecting for underground oil was developed further. The ten- cy in motor fuels is toward the production of single hydro- ons or a group of three or four in order that the combustion utomotive engines may be precisely controlled. The new lyform" process combining polymerization with cracking was losed. At least ten petroleum refineries were using bauxite for ching paraffinic oils. Naphthenic acids extracted from lubri- g oil fractions became commercially available. Development of new ments for lumber is particularly important because much timber cut cond growth, which may have a large proportion of sapwood, thus mak- t more susceptible to staining. Urea was being used as an aid in sea- ng lumber; wood can be easily bent by treatment with urea. Lignin has referred to as the "greatest economic waste in the world today," and ys can be found to hydrogenate lignin cheaply it may become the source whole new series of organic compounds. Newsprint was produced from hern yellow pine at Herty, Tex.; the U.S. Forest Products laboratory ared newsprint by mixing unbleached semi-chemical pulp from southern trees with groundwood pulp from southern pine, and at Syracuse ersity newsprint was made from red pine. "Velo" cold-set ink and nickel were described; isophorone was used in improved inks, stencil pastes roll-coating finishes. Research was in progress on the production of ng paper from low-grade cotton; paper made from cotton burs and stalks under test in Texas. The U.S. Institute for Textile Research published esults of a broad program of textile-drying investigation; the U.S. de- ment of agriculture contributed a new process for sterilizing textile s. Uses for cotton discussed by the National Cotton council, which is orting extensive investigation at Mellon institute, included bale cover- stabilizing road cuts and fills, protecting tree seedlings and beehives, for peanuts and fertilizers, and plastics.

Vinyon" is being utilized in making a variety of felts. The production announced of "Vinyon" yarn of 74% greater tensile strength than iously available. Thirty-six mills were licensed to make nylon hosiery, plans were approved for a second plant for the manufacture of nylon at Martinsville, Va., with full operation scheduled for the spring of . Dot patterns were being applied electrostatically on dress goods. The ed States manufactures 96% of its dyes. Dehydrated castor oil is aying potentialities in the manufacture of quick-drying paint and ish; tung oil is being deodorized. Road performance and life studies w-pressure tires have shown a doubling of mileage since 1927, gains ted through research in materials, design and construction. Electrically uctive rubber is being commercialized. In so-called rubber synthesis rchers are not building a replica of nature's product but are shaping ific molecules to meet particular needs. About 2,000 tons of synthetic er were produced in this country during 1939 and around 11,000 tons made in 1940; plans call for the production of at least 20,000 tons ubber substitutes by the fall of 1941. A new process deep-draws sheets ellulose acetate into various shapes. Outdoor furniture was made of en extruded cellulose acetate-butyrate moulding composition. The use hyl cellulose, benzyl cellulose, as well as "Vinylite" in commercial floor rings was reported. A training monoplane was built with phenolic- egnated spruce plywood, the army air corps evolved a Bellanca stic plane" whose wings are formed plywood, bonded with a self-setting . Tractor seats moulded from a soybean protein-formaldehyde plastic in production. The output of "Vinylite" resins was increased sev- times and will be tripled by a new plant. Calendered "Vinylite" sheets applications as rubber and leather successors, particularly in articles ttire. The development of collapsible tubes formed of vinyl sheet erial was reported. "Saran," a vinylidene-chloride thermoplastic resin, employed in the manufacture of synthetic rattan. The production of mine resins ("Melamac"), especially for laminating and surface coat- was announced.

anada.—The National Research council was in 1940 working in close peration with the department of national defence and the war supply d. Investigations were being made on textiles for military purposes and on the development of paints for the detection of poison gases; gas-mask equipment was being examined. Oil-dilution studies of aeroplane engines were carried out; Canadian engineers were building an electric aeroplane, powered by light-weight storage batteries. Research reports appeared on chromium-molybdenum steels and on phases of powder metallurgy; an investigation of uranium as an alloying element was going forward. Canada leads the world in platinum production by the treatment of nickel-copper matte at Sudbury. The principal development in the chemical field was the establishment of a large explosives plant at Fraser, Ont. A new process was described for the manufacture of acetic anhydride from acetaldehyde. The National Research council studied agricultural alcohol as a motor fuel. New ways of processing wood to provide raw materials for organic synthesis were described. Textile-plant modernization received much attention. The metallic contamination of foods was given research, and work on milling and baking quality of wheat and malting quality of barley was part of a program of co-operative investigation.

Brazil.—The government established the Instituto Nacional de Technologia to study the use of Brazilian raw materials. Companies in São Paulo contributed under a fellowship scheme for the maintenance of the Instituto de Pesquizas Technologicas. The ministry of agriculture was stimulating the use of fertilizers. Sacks made of caroa fibre were reported to be 50% lighter than those of jute; another substitute for jute (macambira) can be employed in manufacturing canvas and carpets as well as bags. The demand for oiticica oil in the United States has greatly benefited the main producing state of Ceará; cottonseed cake was being used for foodstuffs and fertilizers. The Departamento Nacional de Cafe acquired a little plant in which to experiment on the production of a plastic, "Cafelite" and oil from coffee by the Polin process.

France.—Oxygen supply in air-raid shelters was studied. The government ordered the industrial utilization of wastes of all sorts; lubricating oils were regenerated and volatile solvents recovered generally; specifications for aviation-engine oils were published. Hydrogen from ammonia was put to trial as a motor fuel.

Belgium.—A pickling process in successful operation had for its active agent ferrous chloride. Government tests showed that a supersulphate cement, "Sealithor" made from granulated blast-furnace slag, slaked lime and calcium sulphate, was a little stronger than portland cement.

Netherlands.—Investigations in the low-temperature regions made accessible by the adiabatic demagnetization method were described in a treatise issued by the Kamerlingh Onnes laboratory at Leiden. Research was conducted in trying to make a textile fibre from the waste gases of a cracking plant. "Brocafil," a suture material, was prepared from the collagen of tendons.

Great Britain.—The Department of Scientific and Industrial Research, which celebrated its 25th anniversary, published economical type designs in structural steelwork for factories. Activity in the chemical industry was shown by the expansion of various companies. The Fuel Research board announced details of its work on the design and development of a retort for producing free-burning, smokeless fuel. In the Perrin process low-carbon steel ingots can be manufactured directly from the acid converter with a pig iron too high in phosphorus for the normal acid Bessemer process. Melting operations in the non-ferrous industry and the rolling of magnesium were investigated. A new process, the "Barimar," was announced for welding together steel and aluminium. Glass curbs, making highway edges stand out more clearly at night, were being tried. "Spectralite" is a plate glass that has a colour-tone in harmony with the goods to be displayed in a window. In 1914 no scientific glassware was made, but in 1940 a wide variety was available. The government appointed committees on synthetic processes for the production of oil from coal, low-temperature carbonization, liquid products obtained by high-temperature carbonization, alternative fuels for internal combustion engines, "colloidal" fuel and efficient use of fuel in wartime. Camouflage grew lustily through paints and coloured roofings; latex paints were applied to windows to reduce damage from explosions.

Improvements were effected in mould-making machinery, in luminous mouldings, in printing and painting moulded plastics ("Tapinex" process), and in electrodepositing metals upon resins ("Menomat" process). Activity in cellulose acetate plastics was marked, among the products being sheets for aircraft screens, gas-mask eyepieces and transparent containers. A rayon-like fabric was prepared from seaweed. The production of nylon yarn was postponed by the war, but nylon was developed for brush bristles, surgical sutures and fishing casts and lines. The dyestuff industry was in 1940 eight times larger in output than in 1914; dye makers in fact supplied in 1940 upward of 90% of the requirements. The Department of Scientific and Industrial Research opened a new water research laboratory at Watford. Co-operative with the industries concerned, investigations were conducted on river pollution by beet sugar and milk factory effluents. "Macon" is a cured mutton or lamb. A small-scale plant to dry foodstuffs was in operation at the low-temperature research station. The application of latex to highway and floor surfacing was investigated in Malaya; the preservation of latex by sterilization in the presence of buffer solutions also was studied. The Rubber Research Institute of Malaya suggested the use of fermented coco-nut milk as a coagulant for latex because of the shortage of formic and acetic acids.

Norway.—A plant was erected in Oslo for experiments on the recovery of potassium salts from sea water. "Fullgjodsel" is a new compound fertilizer of three types. The possibility of producing refractories from Norwegian raw materials was investigated.

Sweden.—Electrification on a wide scale and inventions of national importance were being promoted by the government. A new wood preservative consists of zinc and chromic arsenates. The toxicology of cadmium fumes was studied. A novel type of elastic concrete sections was put to practical use; the "Metalyt" process involves the electroplating of ceramic products with thin layers of soft metals. The Svedlund wood-gas generator is claimed to enable burning even fresh-cut wood as a source of motor fuel. Colchicine was applied in producing "giant" trees of larch.

Germany.—Standardization proceeded throughout many industries. Studies were made of occupational arsenic, thallium, nickel carbonyl, carbon disulphide and naphtha poisoning; data were published on the ex-

plosion limits of industrial gases and solvent vapours; research was conducted on the prevention of acetylene-air explosions by the addition of inert gases. There was a resurgence of investigation on the improvement of the usefulness of wood by water-, mould- and flameproofing; standards were laid down for flameproofing agents. Gas warfare and air defence were studied; it was concluded that artificial smoke forms the best means of protecting a city from air raids. The high-pressure carbonyl process for extracting nickel from matte is regarded as an important metallurgical achievement. The sintering of metal powders, or "metal ceramics," especially of nickel, was under steady development. The zinc industry recorded expansion and modernization of equipment. A caustic extraction method was developed to obtain alumina from clay; phonolite was under renewed investigation as a source of aluminium. The consolidation of soil by the employment of aluminium electrodes is said to be applicable to clay soils. Plastic products replaced many bronze bearings and gears, and aluminium and magnesium alloys were being employed instead of bronze in the manufacture of worm gears. In recent years the potash industry has been reorganized, resulting in a simplification of its structure and a broadening of interests of the producing companies to fields distinct from potash, such as the manufacture of petroleum products and of magnesium and its alloys. Blast-furnace slag was investigated as a raw material for glass manufacture and the resistance of glass to chemical corrosion was improved by zinc oxide. A new safety-glass interlayer is a plasticized butyral of a vinyl acetate and dimethyl maleate copolymer. Production of fats from coal reached 35,000 tons yearly. Luminescent paints and plastics were used on valves, gauges, stairs and pillars of factories subject to air raids. Blackout of buildings was accomplished by orange illumination and windows painted in the complementary colour, light green.

New processes were developed for making cellulose from pine. Ultraviolet and X-rays were found to accelerate the growth of poplars. New forms of the "Igelits" were evolved, especially for the clothing industry; "PeCesilk" is one of these products. "Pe-Ce," or rechlorinated polyvinyl chloride fibre, placed in full-scale production during 1940, was being used in fish nets, rope, and protective clothing. "Perluran" is a synthetic fibre made under a process similar to that followed in the production of nylon. The output of the pioneer synthetic rubber plant was twice that of 1939 and the construction of a second large plant was reported. The manufacture of transmission belts from cellulose triacetate sheets was reported an outstanding success. "Plexiglas" was being used in making shoes and superseded silicate glass in aeroplanes. The explosive P.E.T.N. is made from formaldehyde, acetaldehyde and nitric acid; pentaerythritol is the starting material for the production of tetranitropentaerythritol, the basis for composing a variety of explosives. To expand the nation's agricultural yield to maximum levels by rationalized application of fertilizer, all farmers upon request are required to submit to authorities samples of their soil for analysis. Tinless, phosphated steel cans were being produced extensively. Fodder yeast was cultivated from sulphate liquor under industrial conditions; experiments in the production of fodder albumin from calcium carbide were represented as successful.

Switzerland.—There was research activity in the fields of aluminium, dyestuffs, textile chemicals and pharmaceuticals. Reports on the biochemistry of silicosis were issued by the International Labour office.

Italy.—At the University of Naples 25 occupational diseases in chemical industry were studied. To save nickel, stainless steel was used in coin making; the scarcity of copper was being met mainly through the use of laminated zinc and zinc alloys. It is said that the switch from copper sulphate to copper oxychloride for use as a fungicide in vineyards effects a saving of 35% in the amount of copper used. Bromine from sea water, tetraethyl lead, iodine and potassium permanganate were produced for the first time. The condensation of furfurol and urea was investigated; lignin from sorghum residue is regarded as a source of plastic material; three companies were in 1940 manufacturing synthetic rubber. New projects furnished 50% of the cellulose requirements. About 30 qt. of milk are needed to make the casein for a "Lanital" dress; "Lanital" was used to the extent of 30% with wool in the clothing for soldiers. "Railan" is a fibre made from a viscose and casein mixture. By the Talgius photochemical process direct reproductions of costly woods can be obtained on other materials.

U.S.S.R.—The Institute of Halurgy was investigating the production of natural soda. Studies were continued on the underground gasification of coal and Volga shales. Phonolites and nephelitic syenites were being utilized in glass manufacturing. Research appeared on the nitrocementation of steels, the composition and structure of "Stalinite," and chromium-silicon and chromium-manganese alloys. Work was performed on cast magnesium alloys with increased corrosion-resistant properties. The production of acetylene from methane, by cracking in the electric arc at low pressures, was studied. Polydiene rubber and the oxidation of synthetic rubbers were investigated. Researches were made on the electrocatadyn process of sterilizing fruit juices, on the caseins of various domestic animals and on the use of beebread in foods.

Palestine.—At the Hebrew university supersonics were being applied in the sterilization of orange juice. Impregnated wrappers reduced decay one-fifth to one-sixth of that in oranges packed in the ordinary way.

Union of South Africa.—Manufactures needing development are coal products, motor fuel, sugar and fermentation. The chemistry of the Fischer-Tropsch process was studied; colloidal lead stabilized with 0·25% rubber was found to impart antiknock properties to gasoline.

India.—Research was in progress on the processing of mica for insulation purposes. In decolourizing china clay, hydrochloric acid treatment appears to give the most promising results. The Industrial Research bureau was pursuing investigations on casein plastics, uses for lactose, application of vegetable oils as lubricants for internal combustion engines, improvement of red lead pigments and paints, effects of molasses on lime-cement mortars and employment of artificial pyrolusite in dry cells. A plastic was made from shellac and casein and a shellac-urea-formaldehyde moulding powder was under development. At the Imperial Sugarcane Breeding station, Coimbatore, cane was crossed with bamboo; the Imperial Council of Agricultural Research evolved better yielding varieties of rice. The Indian Central Cotton committee drew up a program of work that included cotton for road making, cotton cloth for bagging cotton bales, and for wall pap absorbent cotton and artificial leather. The manufacture of rayon being studied basically. The Forest Research institute, which has sho a plentiful supply of tanning materials, was aiding the leather indust

Japan.—More than 50 government laboratories, universities, priv groups and scientific societies issued research reports. Word came of ammonia sulphophosphate fertilizer. A new base-metal catalyst was un development for the oxidation of ammonia to nitric acid. The technochemi problems of alunite were being investigated and research was continued the preparation of alumina from Manchoukuoan clay. The invention recorded of a hard aluminium alloy for sword blades and cutlery. searches were extended on the influence of added substances on the sett of portland cement. The first petroleum well in Manchoukuo had suffici yield to spur other test borings. Fushun cannel coal was found to be a go source of carbon; oil-shale of Manchoukuo yields 100,000 tons of liq fuel annually. Research was conducted on the synthesis of motor fuel fr carbon monoxide and hydrogen. The finance ministry's laboratories p fected a process for producing anhydrous alcohol from calcium carbi research was carried out on the hydrogenation of soft-wood lignin. A he substitute was produced from banana skins; "Somite" is a plastic ma factured from fibrous waste by the viscose process; a way to impreg fibres with a protein coating obtained from soybeans was patented. A sp ning company announced the development of three synthetic fibres; department of commerce and industry planned to establish a laborato for nylon research; "Nippolan" is an undescribed wool substitute. "Thio A" is a rubber-like material derived from formaldehyde; "Hitakol No. is a polysulphide elastomer. Brown factice prepared from polymeri sardine oil was studied comprehensively; a substitute lubricating oil w produced by polymerizing sardine oil. Lubricating oils of high viscos have been synthesized by catalytic decomposition of chlorinated fatty ac

Australia.—The economic cabinet of the commonwealth governme which has a division of industrial chemistry as a branch of the Council Scientific and Industrial Research, planned a laboratory at Melbourne cost about £50,000. Progress was made in arrangements for the erecti of a national standards laboratory and an aeronautical research laborato At Newnes, the Council for Scientific and Industrial Research was explo ing oil-shale and expected to obtain gasoline at the rate of at least 10,00 000 gal. a year. The council published a bulletin summarizing chemi investigations on sheep fleece and announced a process for rendering w "unshrinkable," based upon the finding that certain concentrations of alka properly applied, will reduce the capacity of wool to shrink and felt.

New Zealand.—A systematic search was being made in 1940 for r materials for industrial utilization, particularly important minerals. T Department of Scientific and Industrial Research maintains contact w manufacturers through associations such as those formed for wool, tanni and shoe companies. (*See* also CELLULOSE PRODUCTS; CHEMISTR CHEMISTRY, APPLIED; CHEMISTRY AND ENGINEERING, AGRICULTUR U.S. BUREAU OF; CHEMURGY; PLASTICS INDUSTRY.) (W. A. HA.)

Infantile Paralysis. The year 1940 was one of the wo years for poliomyelitis, with great nu bers of cases occurring in Iowa, Michigan, West Virginia and I diana particularly. Major epidemics appeared also in the Paci northwest and the south Atlantic areas. The first outbreak of 19 occurred in Tacoma, Wash. Poliomyelitis of 1940 was of the ty that attacks those parts of the body concerned in breathing.

The National Foundation for Infantile Paralysis held its a nual meeting late in Nov. 1940. Special committees reported various aspects of the control of this disease.

Virus.—The Committee on Virus Research reported that studies w being conducted to determine the nature of the poliomyelitis virus. Paul Clark, Ph.D., the University of Wisconsin, has concentrated the vir infected material obtained from spinal cords of monkeys so that infecti may be produced in dilution of one part to 10,000,000. Dr. Hubert Loring, Leland Stanford university, concluded that the virus is prot in nature.

Drs. John R. Paul and James D. Trask, Yale university school of me cine, reported the finding of the poliomyelitis virus in stools of patien contacts and in sewage collected from epidemic areas. Dr. S. D. Kram Michigan department of health laboratories, reported the occurrence healthy carriers in an institutional outbreak in Detroit.

Reports were made of the efforts to produce infection with poliomyeli viruses in animals other than the monkey. This confirmed the previou reported findings of Armstrong to the effect that the Lansing strain co be made to produce infection in various cotton rats. All investigato excepting Dr. John A. Toomey of the Western Reserve university school medicine, reported that only this one strain could be made to produce d ease in the cotton rat. Toomey, however, had success in growing, by special technique, several other old as well as newly isolated strains in cotton rat.

The distribution of the virus in the body was reported by Drs. R. Lillie, the National Institute of Health in Washington; Albert B. Sab University of Cincinnati; John F. Kessel, University of Southern Califor and others. All showed that the virus could be routinely recovered fr central nervous tissue of human fatal cases and from experimental anim and that excepting for tonsils, adenoids and lymph gland tissue, no oth part of the body was shown to harbour the infection.

Immunity.—All attempts at producing immunity have thus far met w failure. Dr. Kessel reported that one infection did not routinely prot monkeys from subsequent disease on re-inoculation.

After Effects.—Dr. Donald Young Solandt, University of Toronto, co cluded that the muscular fibrillation resulting from nerve destruction not the primary cause of atrophy of paralyzed muscle. Dr. Clinton

ılsey, Johns Hopkins university school of medicine, concurred in these lts, but Dr. Samuel Soskin, Michael Reese hospital in Chicago, felt in the animals which he studied fibrillation did play an important part ıe degree of atrophy resulting from nerve destruction.

ross and microscopic pathologic studies of paralyzed muscles carried ɔy Dr. Herbert E. Hipps, the Crippled Children's hospital in Marlin, ., showed that occasionally muscles developed a band-like form of ɔneration and that when mattress sutures were used to connect the cle above and below these bands, good functional results were obtained. everal instruments were presented for the more accurate testing of cle strengths. Dr. A. A. Schmier, the Hospital for Joint Diseases in ı York city, developed a muscle tester and recording apparatus suitable measuring in pounds and ounces the pulling power of most of the cles of the body. Dr. Leo Mayer of the same hospital developed a table gned to evaluate in the same terms the muscle power of the trunk.

ırgical Treatment.—Drs. George E. Bennett and Raymond E. Lenhard, Children's Hospital school in Baltimore, concluded that if the maximum efits of physiotherapy are to be secured, patients must be under such within six months of the onset. They further showed that 97% of all kened or paralyzed muscles regain the maximum possible strength ıin 18 months after onset of treatment.

'he value of rest treatment was further emphasized by laboratory .ies on infected monkeys. Dr. Sidney O. Levinson, of the Michael Reese ɔital in Chicago, showed that monkeys forced to exercise during the ve disease process had not only a greater amount of paralysis, but also gher death-rate. (*See* also BACTERIOLOGY.)

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'ant Mortality.

There were 108,532 deaths of infants under one year of age in the United States 1939. Since 2,262,726 births were registered in that year, the ınt mortality rate resulting was 48 per 1,000 live births. ıada, with 13,920 deaths under age one and 229,063 births, had infant mortality rate of 61 per 1,000 live births in 1939, while gland and Wales recorded 30,927 infant deaths and 620,257 hs, so that the infant mortality rate amounted to 50 per 1,000 births. For each of these countries, the infant mortality rate 939 was the lowest on record. Thus, in the United States, the e for 1939 was 6% below that for 1938, when there were 51 ths under age one per 1,000 live births. Compared with 1915, en the rate was 100 per 1,000 live births, the figure for 1939 resented an improvement of more than 50% in a period just year short of a quarter century. Provisional indications are t infant mortality in 1940 will be even lower than that of 9. In the case of Canada, infant mortality in 1939 marks a uction of 41% from the figure for 1921 (102 per 1,000), the t year of record for the dominion. The extent of the improvent in infant mortality in most western countries since the bening of the century is exemplified by the experience of England l Wales. In that country, the infant mortality rate fell from per 1,000 live births in 1900 to 50 in 1939. The principal tors contributing toward this improvement were better sanitan and the general rise in standards of living. Factors are the teurization of milk, systems of food inspection, the screening dwellings to keep out flies, the organization of agencies that vide prenatal and neonatal care and the education of mothers the feeding and care of infants.

There is a wide variation in infant mortality among the coues of the world. Countries with exceptionally low infant mortal- rates per 1,000 live births in 1939 were: New Zealand (31), e Netherlands (34), Sweden (39) and Switzerland (43). On other hand, infant mortality rates of over 100 per 1,000 live ths in 1939 were found in Chile, Bulgaria, Hungary, Lithuania, xico, Rumania, Portugal and Palestine. Infant mortality is o undoubtedly high in many other countries for which adequate ords are not available.

Infant mortality also varies widely within the United States. us, in 1939, when the rate for the country as a whole was 48 1,000 live births, the following states had rates of less than Connecticut (36·3), Massachusetts (39·9), Minnesota (38·8), braska (36·4), New Jersey (39·5), Oregon (39·2), Washington 3·7). The highest infant mortality rates were found in Arizona 3·8) and New Mexico (108·7).

Annual Infant Deaths per 1,000 Live Births in Certain Countries for 1939 and for Each Year in the United States from 1915 to 1939 and in England and Wales from 1900 to 1939

Country	Infant Deaths per 1,000 Live Births 1939	Year	Infant Deaths per 1,000 Live Births	
			United States (d)	England and Wales
North America		1900	...	154
United States	48	1901	...	151
Canada	61	1902	...	133
Mexico	132	1903	...	132
South America		1904	...	145
Argentina	92			
Chile	225	1905	...	128
Colombia		1906	...	132
Uruguay	99 (a)	1907	...	118
Venezuela	139 (a)	1908	...	120
Europe		1909	...	109
Austria	74			
Belgium	74 (a)	1910	...	105
Bulgaria	138	1911	...	130
Czechoslovakia	122 (b)	1912	...	95
Denmark	58	1913	...	108
Eire	65	1914	...	105
England and Wales	50			
Estonia	91 (b)	1915	100	110
Finland	68 (a)	1916	101	91
France	65 (a)	1917	94	96
Germany	60	1918	101	97
Greece	121 (b)	1919	87	89
Hungary	125			
Ireland, Northern	70	1920	86	80
Italy	97	1921	76	83
Latvia	70	1922	76	77
Lithuania	122	1923	77	69
Netherlands	34	1924	71	75
Norway	42 (b)			
Poland	140 (a)	1925	72	75
Portugal	147 (a)	1926	73	70
Rumania	176	1927	65	70
Scotland	69	1928	69	65
Spain	109 (c)	1929	68	74
Sweden	39			
Switzerland	43	1930	65	60
Yugoslavia	144 (a)	1931	62	66
Asia		1932	58	65
India, British	167 (a)	1933	58	64
Japan	106 (b)	1934	60	59
Palestine	107			
Other Countries		1935	56	57
Australia	38 (a)	1936	57	59
Egypt	205 (a)	1937	54	58
New Zealand	31	1938	51	53
Union of South Africa (Whites)	52 (a)	1939	48	50

(a) Infant mortality rate for 1938.
(b) Infant mortality rate for 1937.
(c) Infant mortality rate for 1935.
(d) Official data begin with 1915. For years prior to 1933, the infant mortality rates relate to an expanding birth registration area within the United States.

Deaths among infants are concentrated principally in the early part of the first year of life. Thus, in the United States in 1938, of all deaths under age one year, 27·7% were in the first day of life, 46·5% in the first week, 58·0% in the first month and 85·0% within the first six months of life.

About four-fifths of the deaths in the first year of life in 1938 were ascribed to only nine causes of death. They were: congenital malformations, with 4·5 deaths per 1,000 live births; congenital debility, with a rate of 1·4 per 1,000; premature birth, 14·3; injury at birth, 4·4; pneumonia (all forms), 7·0; diarrhoea and enteritis, 5·0; whooping cough, 1·4; influenza 0·9 and external causes 1·0.

Among white persons in the United States, the infant mortality rate in 1938 was 47·1 per 1,000 live births, while that for Negroes was 79·1 per 1,000. (*See* also BIRTH STATISTICS.)

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Infantry: *see* ARMIES OF THE WORLD; LIGHTNING WAR; MUNITIONS OF WAR; TACTICS IN THE EUROPEAN WAR; EUROPEAN WAR.

Initiative and Referendum.

The year 1940 was fruitful of proposals. Louisiana voted on 32 but rejected 13; California, 17, rejecting 9; North Dakota, 13, rejecting 7.

A constitutional convention proposal was rejected in Iowa (352,142 to 199,247). Panama (144,312 to 1,865) and Paraguay (159,717 to 13,367) each adopted a new constitution. Hawaii voted (46,174 to 22,428) for statehood. Arizona rejected (60,531 to 20,981) proposed definition of public service corporations. Oklahoma voted (256,456 to 210,890) to forbid such corporations to merge with competitors. Bank stockholders' double liability was repealed in Washington (355,047 to 188,929) and Indiana (355,578 to 267,589), which also repealed (344,262 to 229,370) 20-year limitation of banking charters; but retained in Oregon (191,290 to 157,891) and authorized in Utah (81,679 to 11,873).

Nevada voted (22,524 to 8,683) to require a majority of votes at an election, to abolish a county. County manager was authorized in North Dakota (67,804 to 64,519); rejected in Nebraska (254,639 to 179,600) and Fairfax county, Va. (4,537 to 1,148). Arizona voted (58,149 to 41,215) per capita tax of $65 for common, and $95 for high schools; Montana (58,968 to 52,998) 3½ mill tax increase for state university and branches, rejecting (67,197 to 51,921) bond issue for state college buildings. Arkansas authorized (107,115 to 56,500) 1 mill city library tax. Many Ohio rural areas voted to "centralize" school districts. South Dakota voted (149,486 to 193,013) against transferring permanent school fund administration from counties to state. Louisiana adopted (140,543 to 133,876); North Dakota rejected (71,101 to 53,908) proposal to reorganize financial administration. Idaho rejected (88,738 to 53,158) loan of permanent endowment funds on farm property, but approved (86,328 to 50,029) federal disbursement method.

Highway funds were made non-divertible in Idaho (108,358 to 41,148), Nevada (28,679 to 6,831), North Dakota (91,149 to 49,324), Oklahoma (355,431 to 198,100) and South Dakota (142,782 to 109,259). Sales tax was voted by North Dakota (77,962 to 55,810) earmarked for schools and relief (79,393 to 52,731). Louisiana voted (152,437 to 41,024) not to prohibit sales tax. Oklahoma voted (408,599 to 196,711) a graduated land tax, with exemptions. Maryland voted (131,330 to 67,456) against exempting judicial salaries from income tax. Colorado rejected both income (366,049 to 81,787) and intangible property tax (440,202 to 50,806). Washington voted (390,639 to 149,843) 40 mill, general property tax limit, with exceptions; Michigan (843,159 to 602,952) and Arizona (42,748 to 41,696) rejected proposed tax limitations.

Oregon voted (183,488 to 129,699) against fixing tax base at average of three years' levies. Exemptions were rejected in Arizona (42,748 to 41,696, "tax free homes"); Arkansas (97,267 to 68,314, $100 chattels) and Louisiana (manufacturing plants, 142,319 to 125,573; "electric co-operatives," 146,025 to 121,386). Arizona voted (53,124 to 37,856) vehicle license tax, excluding all others thereon. South Carolina voted (30,762 to 11,664) biennial levy of annual taxes. Missouri voted (535,642 to 445,194) non-partisan judiciary; Maryland "people's courts" (172,616 to 72,371), an additional circuit judge (117,594 to 68,923) and authority for the court of appeals to appoint its clerk (121,080 to 73,653); West Virginia rejected (300,979 to 133,256) "reform judiciary amendment," substituting summary courts for justices of the peace and constables. Texas voted (268,645 to 114,343) direct appeals to supreme court on certain questions. California rejected (1,082,647 to 723,330) elaborate judiciary amendment, affecting jurisdiction, judicial councils, appeals, etc., and another for court review of administrative tribunal rulings (921,832 to 907,761).

Oklahoma voted (294,346 to 212,701) to limit powers of medical examiners. Philippines restored bicameral legislature (1,043,712 to 275,184). South Carolina approved (29,633 to 8,560) biennial legislative sessions and also special ones (30,901 to 10,107); New Mexico (31,490 to 8,560) two 30-day sessions with a 30-day interval between; California (929,527 to 855,845) interim legislative committees, rejecting (1,268,684 to 556,469) annual sessions and budget. North Dakota rejected (64,636 to 61,573) amendment facilitating use of referendum, excluding veto and repeal by legislature. Oklahoma voted (354,433 to 169,196) to require state officers to have been electors therein for a decade. Philippines removed presidential one-term limitation and allowed re-election (1,072,039 to 240,632). South Dakota voted (140,465 to 97,748) against authorizing governor to fill legislative vacancies; Oregon against (188,030 to 186,830) increase of legislative salaries. Prohibition was retained in Oklahoma (374,911 to 290,752) and Prince Edward Island (10,426 to 8,861). Oregon rejected (309,183 to 90,681) private sale and also further restriction of liquor traffic.

The dispensary was rejected in Johnston county, N.C. (7,579 to 3,956) and Talbot county, Md. (3,672 to 705); county option (112,972 to 70,544) and restriction (102,186 to 79,563) in Idaho. The merit system of appointments was approved in Kansas (428,739 to 241,582), Louisiana (147,380 to 128,024) and Michigan (706,764 to 709,894); and rejected in Omaha, Neb. (55,475 to 38,779). Texas voted (222,559 to 147,919) to relieve municipal civil service positions from two-year term limitation. Lima, O., voted (7,330 to 6,828) to improve civil service administration. Tennessee rejected (171,209 to 77,614) extension of governor's term (favourable vote was not a majority of all cast). Maryland rejected (170,581 to 93,124) amendment to prevent governor succeeding himself. Oregon repealed (213,797 to 163,942) term limit for certain state officers; Washington rejected repeal of two-term limit for county officers (267,938 to 208,407). Arkansas rejected (96,628 to 70,131) amendment permitting appointed officers, filling vacancies, to succeed themselves. (C. S. L.)

Inland Waterways: *see* CANALS AND INLAND WATERWAYS.
Inner Mongolia: *see* MONGOLIA.
Insanity: *see* PSYCHIATRY.
Insects: *see* ENTOMOLOGY.
Institute of Pacific Relations: *see* PACIFIC RELATIONS, INSTITUTE OF.
Insulin: *see* CHEMOTHERAPY; DIABETES; INTOXICATION, ALCOHOLIC; NERVOUS SYSTEM; PSYCHIATRY.

Insurance, Accident and Health.

Accident and health insurance experienced its best year in 1940 with premiums estimated in excess of $275,000,000, a gain of $33,000,000 or 13%. Hospitalization insurance contributed much to this gain, although uncertain economic conditions made the public more receptive to insurance to protect earnings. Although non-profit hospitalization companies made rapid strides in large cities, regular companies were in 1940 writing a large volume of hospitalization. Underwriting hospitalization on a sound basis was complicated by people anticipating the need for an operation or hospitalization, but insurance. This was particularly pronounced among women necessitating the insertion of waiting period clauses before benefits become effective on rectal cases, tonsillectomies, appendectomies and female diseases.

Consideration was being given the exclusion of liability for injuries caused by "war or any act of war" because such injuries might develop to serious proportions if the United States should enter the war. For patriotic reasons coverage for draftees, volunteers, national guardsmen and reserve officers entering service were being generally continued without applying war clause restrictions or charging extra for the change of occupation, despite the increase in hazard.

Increased industrial activity as a result of the national defense program undoubtedly accelerated industrial accidents and the concentration of people in industrial centres and army camps increased the possibilities of epidemics. Both situations were being viewed with caution. (C. D. S.)

Great Britain.—The year 1940 presented many problems in the field of accident and miscellaneous insurance, and the business in the United Kingdom was overshadowed by the war. The results of the accident business of British offices for 1939, which were published during 1940, did not fully reflect the influence of the war, and premium revenues were on the whole well maintained.

Workmen's compensation insurance is the one important section likely to maintain its volume. This business is directly related to the course of industry, which under present conditions is fully engaged, with wages increasing in the aggregate. During the year a new act—the Workmen's Compensation (Supplementary Allowances) act, 1940, was passed increasing the weekly payments to injured workmen. Premiums were increased by from 10% to 25% to meet this increased liability.

War risks are not insured through the accident department except to a small extent to cover personal injuries. The Personal Injuries (Emergency Provisions) act, 1939, relieves employers of liability to compensate their employees in case of injury by war risks and also provides compensation to civilians incurring such injury. (*See* also INSURANCE, AUTOMOBILE: *Great Britain;* LAW [CASE]: *Insurance.*) (C. E. G.)

Insurance, Automobile.

The trend toward higher automobile casualty loss ratios which started in 1939 continued throughout 1940. This was particularly true of property damage coverages, where a combination of extremely low rates, a relatively high accident frequency, and increased costs of repairing late model automobiles caused many companies serious concern. It was generally felt that this trend would continue. Premium volume was generally unchanged from 1939.

There was very little change during 1940 in the coverages nted or in the rate levels as respects automobile casualty es, but in the fire, theft and collision field there were sizable e reductions for fire and theft and a policy revision which adened the coverages and clarified the contracts. Fire and ft results continued to be satisfactory.

A very noticeable trend in the automobile casualty business ring 1940 was the widespread adoption of assigned risk plans to vide insurance for automobile owners who could not secure erage through the regular channels. Most of these plans were up voluntarily by the companies without legislation or state trol. There were probably fewer regulatory laws passed in 40, but it was becoming increasingly evident that future years l bring additional control. Most notable along this line was strong agitation for compulsory automobile insurance stat- s of the type now in force in Massachusetts. (G. E. Ho.)

Great Britain.—Motor insurance was attacked from many es as a result of the war. The number of private cars was atly reduced, and the use of commercial vehicles much cur- ed. The yield in premiums is bound to be much lower in 41, though there was in 1940 some lessening in the claim ain since the public became more accustomed to black-out ditions. Another adverse factor was the loss of business due events in Europe. During the first half of 1940, Norway, Den- rk, Holland, Belgium and France were overrun by Great tain's enemy, and trading with those countries became illegal. tish offices had important connections in all those countries ling largely with motor insurance and personal accident in- ance, all of which were lost for the time being. In addition, entry of Italy into the war interrupted many accident con- tions with that country both direct and by reinsurance.

(C. E. G.)

Insurance, Fire. The story in regard to fire insurance, so far as results are concerned, was prac- ally the same in 1940 as it had been since 1938. This means t the losses bore a low ratio, comparatively speaking, to the miums and so the business had a period of comfortable re- ns, if not of undue prosperity. All forms of insurance are ected in their income by the decrease in the returns from in- tments. In the case of fire insurance, however, this is not so portant a matter as in the case of life insurance, because ap- ximately 90% of the income of fire insurance companies is ived from their premium receipts.

The best statistics available for all carriers—stock, mutual, iprocal exchanges and Lloyd's organizations—show that dur- the year 1939 the premiums written amounted to $961,806,000 l the losses paid to $396,605,000. This means a loss ratio of ses paid to premiums written of 41.1%. It should be pointed that the phrase "premiums written" does not mean that that ount of money is received for the business, because there l be many cancellations or policies not taken—one thing or ther will happen to make the premiums received less than the miums written. That, however, is the customary way of ting the statistics in regard to premiums and is the only way ould be done on an annual basis.

There are premium receipts from sources other than strictly business which should be mentioned because the business is tten by much the same group, especially among the stock com- nies, as write fire insurance. About five years ago there was veloped the Extended Coverage Endorsement which insures holder against several forms of loss other than fire and ntning. Prior to this development it was customary to have ividual policies for most of these forms; the extended cover- makes necessary only one piece of paper. This has resulted in an increase in premiums to a certain extent, although the Extended Coverage Endorsement has not produced all new business, since in some parts of the country, for instance where windstorms are quite prevalent, a large amount of windstorm insurance was always carried and is merely merged in the all-inclusive cover. At the same time it is safe to say that the premium receipts have been increased by about 5% over the regular fire and lightning premiums. As this general form was not by Jan. 1, 1941 in full service, a larger increase from it might be expected. In one territory where the fire and lightning premiums receipts were approximately $1,750,000, about $100,000 was received from the Extended Coverage Endorsement. The steady tendency in the business in 1940 was to broaden the cover—to include many hazards in the one policy. (*See* also FIRES AND FIRE LOSSES.)

(E. R. H.)

Insurance, Life. Legal reserve life insurance companies of the United States and Canada continued to make progress during 1940. The total amount of life insurance (excluding reinsurance) in force in these companies at the end of 1940 was estimated at nearly $124,000,000,000, or an increase of about 3% over 1939. The new (original) business issued during the year amounted to about $12,000,000,000. At the end of 1940 the assets of the companies amounted to more than $33,000,000,000, while the payments made during the year to policyholders and beneficiaries totalled almost $3,000,000,000.

The mortality experience during 1940 was favourable. Mortality from pneumonia declined to a new low in 1940, an achievement credited largely to the recent advances in chemotherapy. The downward trend of the tuberculosis death rate was maintained, and the principal communicable diseases of childhood also showed lower death rates. Safety campaigns aimed at preventing automobile accidents helped to keep automobile fatalities at a relatively low level. The interest rate earned on the companies' assets continued on a downward trend during the year, reflecting to an increasing degree the low rate of return obtainable in recent years on new investments. The low interest rate earned by the companies is necessarily reflected in a higher cost of insurance. During 1940 the yields on highest grade bonds, both government and corporate, reached the lowest points in history. Company holdings of United States government securities continued to increase and in 1940 comprised about 20% of the companies' assets. Generally speaking, the companies continued to experience difficulties in finding an adequate volume of appropriate and remunerative investments for their new funds.

The possible repercussions of the war in Europe necessitated some action by life insurance companies (particularly those in Canada) with respect to new insurance. This action was required because premiums charged for life insurance in normal times do not contemplate, and make no provision for, the hazard involved in insuring a great group of men likely to engage in military or naval service in time of war. Only a very small portion of the life insurance policies in force in companies of the United States and Canada in 1940 required the payment of extra premiums or contained limitations of the life insurance benefit in the event of war service. However, while life insurance companies will absorb the war risk on practically all of their existing policyholders, the safety of the insurance of such policyholders demands that the companies keep them secure, either by providing for the payment of an extra premium or by limiting the life insurance benefit in the case of new policies to be issued to those subject to military or naval service in time of war. This is a risk which, to a limited extent, should be undertaken by the government.

It was in recognition of such a limited obligation that the United States government undertook, during the World War of

1914–18, to provide insurance protection for men in the armed services. The principle of that legislation is found in the National Service Life Insurance act of 1940, under which the government again enabled the men in the armed services to obtain up to $10,000 of life insurance at standard rates without any extra premium. Congress also enacted the Soldiers' and Sailors' Civil Relief act of 1940 which, among other things, is intended to help those entering the military forces to maintain their existing life insurance.

The Temporary National Economic committee, which was created in 1938 by the congress of the United States for the purpose of studying the problem of concentration of financial power, brought to a close in 1940 its formal hearings on life insurance and the record thereof. To supplement and correct such record, a "Statement of Life Insurance," to which 178 different life insurance companies of the United States saw fit to become signatories, was submitted to the committee and will be incorporated as a part of the permanent record of the Temporary National Economic committee.

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Insurance, Marine. The year 1940 was one of the most difficult years ever experienced by marine underwriters. Commencing with the invasions of Norway and Denmark, followed almost immediately by invasions of Holland and Belgium, and then the complete collapse of France, it became increasingly difficult to know the status of the merchant marine of these countries.

Some changed officially over night from neutrals sympathetic to Great Britain to outright enemies. Eventually the merchant fleets of Norway and Holland resumed operations under arrangements with the British government. Some Danish ships were in 1940 running with permission of Great Britain, but Belgian ships disappeared from the seas. After a period of uncertainty the French merchant ships were interned.

When Italy declared war on France and England the U.S. government extended the war zone forbidden to U.S. ships and included the Mediterranean sea. This was a blow to American commerce in that area as it meant that only Greek ships remained available to handle the traffic. Lisbon, Portugal, for all practical purposes, remained the only port in Europe where U.S. ships could go. With Italy and Greece at war, the situation became more complicated, but, with the success of the British and Greeks in the eastern Mediterranean, commerce was carried on by way of the Suez canal, the Greek merchant marine operating under the direction of the British government.

Through the medium of the American Cargo War Risk Reinsurance exchange the war risk insurance requirements of all American importers and exporters were satisfactorily handled in spite of rapidly changing conditions.

In order to provide the same adequate facilities against marine risks that underwriters have provided against war risks through the War Risk exchange, a number of the largest marine companies organized the American Cargo Marine Reinsurance clearing house. It was hoped that this would develop into a reinsurance market in the U.S. that would enable all the marine companies to carry on their marine cargo business regardless of what might happen in Europe.

Marine insurance on ocean hulls ran in a normal way, the outstanding feature being the large increase in capacity which was developed in this market in response to requests from the maritime commission. The commission was desirous of having a United States market with sufficient capacity to take care of the requirements of American shipowners without recourse to a facilities abroad, which up to the close of 1940 were a most i portant factor but which might be reduced or eliminated by t war in Europe. Marine underwriters were in 1940 doing th utmost to provide complete facilities for all U.S. shipowne interests as they have done for U.S. shippers.

Due to the neutrality law U.S. ships were kept away from t war zone, with the result that after 15 months of war only c U.S. ship had been lost from war perils. The "City of Rayvill a freighter belonging to the maritime commission, apparently i a mine in Bass strait between Australia and Tasmania and beca a total loss. There was no war risk insurance carried on this sh so underwriters had no war risk losses on U.S. ships.

In the U.S., the Great Lakes underwriters appeared to having a favourable year until right up to the close of the 19 season. On Nov. 11, the anniversary of the great storm of 19 another storm, the worst since that time, swept across the lak leaving death and destruction in its wake. Three large bu freighters were known to be totally lost, one badly damaged a two others driven ashore. Two large car ferries were ground and seriously damaged and a number of small craft suffer Although many on the damaged vessels were rescued, the deat amounted to 150.

As a result of this storm, underwriters on the lakes may sh a loss for 1940.

Inland marine underwriters also suffered a heavy and un pected loss toward the end of 1940. The Tacoma Narrows bri across Puget sound, having a central span of 2,800 ft., had be completed and formally opened in July 1940. It was owned the state of Washington and carried $5,200,000 insurance. T bridge was considered one of the finest suspension bridges in t world. On the morning of Nov. 7, with a 42-mile wind blowing from the sound, it was noticed that the roadway of the bri was undulating badly; the heaving and writhing motion increas until finally about noon the vertical cables snapped and the roa way fell 190 ft. into the sound. The cost of rebuilding will r into millions of dollars. (S. D. McC.)

Insurance, Old Age: *see* SOCIAL SECURITY.
Inter-Allied Debts: *see* WAR DEBTS.

Interior Decoration. The year 1940 gave to designers the United States their most m mentous opportunity. One by one those imports, which the pu lic had long taken for granted, became almost impossible to buy English chintzes, French wallpapers and textiles, ornamental gl from the Low Countries, Scandinavia and Czechoslovakia, a tiques from all over the earth.

In an era of expanding construction for the only great coun with money, time and talents not devoted to annihilating attempting to preserve civilization, unprecedented strides w taken in creating, publicizing and marketing American decorat work of almost every type.

Nor were these new home-grown products a mere imitation what Europe formerly provided. The low-cost house—sm compact, beautifully designed with an eye to style and conv ience, demanding the minimum of time and money for upk and replacement—had at last come into its own. Not only the vast population employed in the industrial revival dem such accommodation, but, in addition, houses of this type beca a top-flight fashion, appealing to modern-minded individuals almost every class of society.

Such radically new settings, where every inch and every pe must count, constituted a challenge to the designer never bef equalled since pioneer days. The problem of simplification a

ıpactness demanded by the one-room house or apartment had be met. To design for and furnish so limited an area without sing claustrophobia, permitting the owner to eat, sleep, work, ertain and be happy in a single multiform room, was in 1940 outstanding American achievement.

Vith space at a premium, there was no lack of colour. Patriotic emes of red, white and blue were never more popular. Great d-flowered wallpapers, too, or those in vivid plaids and stripes ed to counteract the black newspaper headlines. The use of ror for its brilliance, as well as for its wizardry in producing illusion of greater size, received fresh impetus. Hobby rooms r "hobby corners" where space did not admit of a more nded setup—helped to rest and refresh the mind. The prac- lity and beauty of real leather, not only for furniture where it ld be intricately worked, but also for walls, floors, lamps and nfinite variety of other decorative objects, opened an entirely vista of creative opportunity.

Vith the compression of living space at home came an increas- effort to render public entertaining spaces smarter, more at- tive and more stimulating to the imagination. Not only was tendency seen in the large centres, where taste has always n a step ahead, but also in the smaller cities and resorts. For, n the world apart from the western hemisphere closed to travel, ericans explored their own country as never before, and spent ir money at home. Trains, planes and coastwise shipping be- e art-conscious as a means to increased earnings. Even hos- ls realized that beauty has a therapeutic value. One wonders n the manufacturer will come to see that the same principle easily and cheaply be applied to raising the morale and cut- ; the turnover in industrial plants. (D. Dr.)

ernational Labour Organization. In 1940 the I.L.O. remained almost only "going" international convention body left in a world at , or involved in its consequences and threats of entanglement. League of Nations as a political organization for the time ng had ceased to exist. Some of its non-political activities tinued on a more restricted and less effective basis than the k of the I.L.O. which has grown in significance for social wel- in all countries. Entirely non-political, I.L.O. research, cial information, statistics (on a world-wide basis) are lyzed and interpreted for use in dealing with the problems of our and industry by the three-party real democratic method in ce or war or after-war epochs.

Added are the conclusions and recommendations garnered from discussion participated in by the representatives of the three ties in interest—governments, employers and workers. In International Labour conferences (mostly annual, the 26th, o, postponed on account of war), 67 conventions (treaties) e been adopted, binding only on member-states ratifying them. en provide for suspension in wartime, and two more allow ex- tions "in the event of emergency endangering the national ety."

Ratifications registered March 15, 1940 numbered 871, with ypt (Oct. 5), and perhaps others since then. The independent mmittee of Experts, meeting in April, examined some 600 re- ts of applications of conventions. Thus a vast amount of work nt on even in wartime, and the binding cement of international igations entered into by democratic process did not crack.

Of 49 states-members left in 1940 after the axis powers with- w, three were absorbed by, and 13 lost their independence ough the aggression of the axis powers. Yet 38 governments, luding several since destroyed and all 16 American members lorsed in writing their support of the principle laid down by governing body in Feb. 1939, that the I.L.O. continue to function as completely as possible. Several members whose governments were in exile maintained active relations and some paid dues, and otherwise helped the I.L.O. to function.

So continuing with admirable fortitude and unabated zeal, the staff, depleted by the loss of more than two-thirds of its personnel, and limited in resources by the reduction of current contributions, carried on in Geneva until August when communications became too difficult. Then leaving a small remnant there, the others moved to the new Working Centre in Montreal established through the co-operation of the Canadian government and the hospitality of McGill university. Some of the staff went on special technical missions to member-states to assist in setting up systems of social insurance, and in adapting municipal legislation to I.L.O. standards; others to strengthen the London and Washington branch offices, and representation in Latin America.

Wherever located, the I.L.O. remains the greatest arsenal of fact and information concerning labour, social and economic welfare, and the essentials of social justice, whether in wartime, in preparation for the resumption of peace, or in dealing with the after-effects of war, in all countries and for all countries, belligerents or not. For evidence one need only consult the chief publications of the year, remarkable alike for the timeliness and value of the research they reveal. To cite a few: *Actuarial Technique and Financial Organization of Social Insurance* (568 pp.); *Methods of Collaboration between Public Authorities, Workers Organizations and Employers Organizations* (346 pp.); *Compensation of War Victims; Silicosis* (233 pp.); *The I.L.O. Year-Book, 1939–40; The Year-Book of Labor Statistics 1940.* The valuable services of the *Legislative Series,* the *Industrial Safety Survey,* and the *International Labor Review* (monthly) with which the weekly *Industrial and Labor Information* has been combined, are now maintained in Montreal. (*See* also Child Labour; League of Nations; Refugees.) (S. McC. L.)

International Law. The contributions of 1940 to the field of international law arose largely in relation to incidents connected with the war in progress.

Pan-American Action.—In late 1939 the countries of the American continent, inspired by the need for preserving Pan-American neutrality, had in a resolution known as the Declaration of Panama proposed to Great Britain, France and Germany that belligerent action be excluded from a zone around the Americas (except Canada) varying from 300 to 600 mi., under penalty of sanctions exerted by the American republics. In early 1940 the replies were received. The British note of Jan. 15 declined to surrender established belligerent rights, denied the power unilaterally to impose, especially with sanctions, such a new closure of the seas to belligerents, maintained that the zone might provide a sanctuary from which German vessels could attack Allied shipping while escaping capture, and that German ships might pass through the zone or engage in inter-American trade, earn foreign exchange and deprive the Allies of the fruits of their superiority at sea (*N.Y. Times,* Jan. 16, 1940). The French answer of Jan. 23 politely rejected the proposal, pointing out that acceptance would require the assurance that German warships and supply ships would not be permitted to enter the zone. It also pointed out the immunity thereby extended to German refugee merchant shipping, which the American countries would have to guarantee would not endeavour to leave port. It added that these countries would have to assume responsibility for suppressing acts of unneutral service, including radio communication, of aid to Germany. France also objected to any unilateral enforcement of the declaration (2 *Bull.* Dept. of State, 201). Germany in its answer of Feb. 14 admitted the possibility of changing international law in accordance with new conditions, but suggested that

unilateral action was not permissible and that Germany had undertaken no acts in the zone contrary to international law. The German note then alleged that the "exception" made to the Monroe Doctrine in the matter of extending territorial advantages to France and Great Britain on this continent involved discrimination against Germany, which had no territorial aspirations in the western hemisphere. The note said these advantages might be neutralized if Great Britain and France gave a guaranty not to use their American positions as bases for belligerent operations. Canada's peculiar position in this respect was pointed out. While resenting a proposed ban on the entry into the zone of German warships but not, so Germany claimed, of Allied warships, Germany expressed a willingness to discuss the question. Success, however, it suggested, depended on a revision of British and French ideas (*N.Y. Times,* Feb. 15, 1940).

Thus, all three belligerents in effect rejected the Declaration of Panama. While some attempt to patrol the zone was made by the United States, and while the proposals of the declaration were violated by belligerent captures or scuttling within the zone on several occasions (*cf.* the "Hannover," March 9, 1940, 2 *Bull.* Dept. of State, 568; the "Wakama," March 16, 1940, 2 *Bull.* Dept. of State, 306) there appeared to be no serious belief that the declaration could be enforced. It did not have the force of law. One commentator suggested that since belligerents have for a long time encroached on the rights of neutrals, the declaration is a natural response for the protection of neutrals and that new law has often been made by a widespread demand, ultimately acquiring the recognition of others (Masterson, 1940 26 *A.B.A. Jour.* 860). Perhaps the declaration may be considered as superseded by the proposals of United States house bill 1776 (Jan. 1941) which, unless amended, would admit to American harbours the warships of certain belligerents favoured by the president.

United States Protests Against British War Measures.—The department of state objected to the British demands that neutral shipping voluntarily enter British ports for contraband control on the ground that U.S. shipping was by the Neutrality act confined to inter-neutral trade and was entitled to the presumption of innocence and that U.S. shipping companies had indicated a willingness to co-operate with the British in such matters. Claims for compulsory diversion were reserved (2 *Bull.* Dept. of State, 4–5).

On Jan. 2, 1940, a note was released protesting as violative of the Eleventh Hague convention the seizure on neutral vessels on the high seas of private mails destined to the U.S. or of U.S. mails addressed to neutral countries, as well as censoring of U.S. mails on vessels forced into British ports by some form of duress (2 *Bull.* Dept. of State, 3). The British answer of Jan. 20, 1940 referred to the 1916 measures and maintained that the necessity for controlling contraband made it necessary to search the mails, an interpretation which would in effect nullify the Eleventh Hague convention (*N.Y. Times,* Jan. 21, 1940, part I, p. 26). The U.S. also protested, Jan. 22, 1940, against the long delay of U.S. ships at Gibraltar, the removal of mails and compulsory diversion of U.S. ships to the prohibited port of Marseilles.

Europe and China.—The United States notified Germany in June 1940, after the fall of France, in accordance with a resolution of the conference at Panama, that it would not recognize or acquiesce in any transfer of territory in the Americas from one to another non-American power (2 *Bull.* Dept. of State, 681). The German government in reply pointed out that recognition of the Monroe Doctrine was conditioned upon noninterference of the United States in the affairs of Europe (3 *Bull.* Dept. of State, 3). Thereupon, Secretary Hull undertook to distinguish that Doctrine from the conquests of Germany and Japan, without naming those countries. On March 30, Secretary Hull advanced general reas for refusing to recognize the Nanking regime set up, as claimed, by the Japanese (2 *Bull.* Dept. of State, 343). An jection to any upset in the *status quo* in French Indo-China announced Sept. 23, 1940 (3 *Bull.* Dept. of State, 253). department also protested against annexation of the Baltic publics by soviet Russia, July 23, 1940 (3 *Bull.* Dept. of Sta 48), although Kerensky's ambassador in Washington, June 1921, had refused to admit their independence and claimed they constituted Russia's door to the Baltic. The doctrine non-recognition thus exemplified is sporadic and discriminatory application, stands on no conceded principle and is actually form of intervention. International law has not been based the power of one or more nations to pass moral judgment u the acts of others. A caveat of the United States against change in the *status quo* of the Netherlands East Indies published April 17, 1940 (2 *Bull.* Dept. of State, 411).

Exchange of British Naval Bases for United States Destroyers.—In August and September a far-reaching executive agre ment was concluded for the exchange of eight British naval ba (those at Newfoundland and Bermuda were characterized gifts) for 50 United States destroyers (3 *Bull.* Dept. of Sta 199–201). The exchange was criticized widely as a violation international law (*cf.* 34. *A.J.I.L.* 569) and its circumvention congress and senate was also challenged. But apparently it only the forerunner of H.R. 1776 of Jan. 1941, which was signed to grant the president the power to sell, exchange "otherwise dispose of" any article of "defence" to any coun or countries, for any purpose, and on such terms, as he saw fit, be used against such countries as he determined. This criticized as an unconstitutional abdication of the power congress and the senate, and was in early 1941 under debate.

The "Altmark."—In February the German steamer "Altmar carrying prisoners taken from British and other merchant sh by German raiders, was attacked by British warships in a N wegian fjord, after having skirted the coast of Norway for seve hundred miles in an attempt to reach a German port. It was mitted that this was a violation of the neutrality of Norway, it was argued that the Norwegian government was at fault, si it should have prevented the "Altmark" from carrying prison through the territorial waters of Norway and that this justif the British self-help. The question of Norway's obligations u der international law gave rise to vigorous debate, but it see clear that Norway was not privileged or under a duty to se or search or take out the prisoners on board the "Altmar which, whether a public or a private ship, would seem to ha been within her legal rights in passing through Norwegian t ritorial waters.

Removal of Enemy Nationals from Neutral Ships.—Not like the situation in 1914–16, German nationals were remov from neutral ships by British war vessels on several occasio The most important of these incidents arose between Japan a Great Britain, which removed 21 Germans from the "Asa Maru" in far eastern waters. Britain ultimately returned 12, it believed, but kept nine on the ground that they were more th mere reservists.

Belligerent Requisition of Ships Abroad.—The power of nation to requisition ships abroad, which arose in connection w the acts of Spanish authorities during the Spanish civil war, w again raised in more tenuous form by the purported requisiti by Belgian authorities at London, undertaking to act as a gove ment, of several Belgian but U.S.-owned vessels in U.S. h bours, some of which had in the meantime been transferred the Panaman and other registry. Belgian officials maintai that the vessels were to be turned over to Great Britain for w

e. One such libel was filed by Belgian authorities in a ited States district court in Texas. Among the questions to considered were the power of the Belgian "government" at ndon to requisition, the conformity of the requisition with lgian law, the duty of a U.S. court to give effect to the Belgian ders, the actual seizure of the ship by the Belgian consul in U.S. port.

The Mexican "expropriation" of foreign-owned oil properties d Bolivian cancellation of the concession of a U.S. oil company re not settled during 1940, although diplomatic correspondence s exchanged. A proposal of the United States on April 3, 40 to arbitrate the Mexican oil issue was rejected by Mexico May 1. Mexico unilaterally valued the surface properties, she proposed to pay for, at about 200,000,000 pesos. The npanies insisted on a return of the properties at least to com- ny management under a long-term operating contract and re- ed to surrender the subsoil rights, the recognition and main- ance of which the United States successfully insisted upon ing the long correspondence with Mexico from 1917 to 1927. e issue involved important questions of international law. (*See* o NEUTRALITY; PACIFISM.) (E. BD.)

ternational Trade. The foreign trade of 46 countries for the first 6 months of 1939 and o is shown in Table I. The list includes 14 European, 13 erican, 13 Asiatic, 4 African and 2 Oceanic countries. The ntries are ranged in descending order according to the dollar ue of their total trade, imports and exports combined. The al in millions of United States currency dollars has been ained by converting the amounts in original currencies at rage rates of exchange. The totals in millions of the old ited States gold dollars are shown for the purpose of com- ison with the data published in previous years. The aggregate ue of the trade of these 46 countries from Jan. 1 to June 30, o was $15,910,717,000 currency as against $14,040,598,000 the corresponding period of 1939, an increase of $1,870,119,- or 13·3%. The value of the trade in 1940 was larger than in 9 or 1938, but somewhat below the corresponding total for 7 when prices were slightly higher. Of the countries listed, showed an increase of $2,083,170,000 in 1940, while the re- ining 13 suffered a loss of $213,051,000. The largest increases, currency dollars, were recorded in the trade of the United tes, $851,000,000; Canada, $228,000,000; United Kingdom, 4,000,000; British Malaya, $137,000,000; Australia, $98,000,- ; Argentina, $82,000,000; and the Dutch East Indies, $79,- ,000. Decreases were largest in the trade of Sweden, ,000,000; Denmark, $49.000,000; New Zealand, $39,000,000; l Turkey, $25,000,000.

ince June 1940 international trade as heretofore known was ried on only by the countries of the British empire, the 21 erican republics, China, Japan and a few smaller countries ch preserved at least a shadow of independence. The exchange goods between Germany and the countries of southeastern rope was in 1940 only crude and compulsory barter. The nination of continental Europe, with the sole exception of in and Portugal, both as a source of supply and a market, ated a serious situation for the Latin American countries ich, in 1938, had imported from continental Europe goods ued at $516,959,000, or 34·1% of their total imports. Their ers were transferred to the great northern neighbour and ited States exports to the Latin republics in the first year of war rose to $733,135,000 in value, an increase of 50% over 8–39, while United States imports from the 20 South Ameri- nations reached the value of $615,915,000, an increase of 3%. Efforts were also made to promote trade between

Table I.—*Foreign Trade of 46 Countries*
For the first 6 months of 1939 and 1940 (in millions)

		1939	1940
United Kingdom	£	712	882
United States	$	2,510	3,362
Canada	Can. $	725	1,044
Japan	yen	2,933	3,574
India	rupees	1,725	2,162
Australia	£	94	134
Argentina	pesos	1,415	1,758
British Malaya	S. S. $	594	983
Sweden	crowns	2,047	1,840
Switzerland	francs	1,533	1,832
Dutch East Indies	florins	508	720
Union of South Africa	£ S. A.	64	77
China	yuan	1,132	1,901
Brazil	milreis	5,046	5,446
Denmark	crowns	1,576	1,450
New Zealand	£.N.Z.	65	70
Rumania	lei	24,782	35,604
Hungary	pengo	525	600
Eire	£	33	43
Egypt	£ E.	33	43
Yugoslavia	dinars	4,942	6,938
Burma	rupees	422	465
Philippines	pesos	236	264
Chile	pesos	527	630
Cuba	pesos	125	135
Iran	rials	1,886	1,936
Ceylon	rupees	270	339
Colombia	pesos	191	164
Greece	drachmas	10,931	13,148
Turkey	£ T.	126	107
Portugal	escudos	1,486	2,067
Bulgaria	leva	3,338	5,554
Uruguay	pesos	85	98
Peru	soles	295	362
Chosen	yen	212	219
Southern Rhodesia	£	9	12
Lithuania	litas	200	258
Trinidad	W.I. $	36	48
Estonia	crowns	107	108
Iraq	dinars	6	6
Taiwan	yen	61	82
Guatemala	quetzales	19	17
Iceland	crowns	49	73
Ecuador	sucres	142	174
Sierra Leone	£	2	2
Haiti	gourdes	43	38
Total	currency $	14,041	15,911
Total	gold $	8,293	9,397

the republics. The ministers of finance of Argentina and Brazil signed an agreement at Rio de Janeiro on Oct. 6, 1940, to recommend measures designed to facilitate trade between the two countries and to minimize the sources of complaint. Negotiations for a similar accord with Argentina were initiated by the foreign office of Uruguay on Oct. 18, 1940. An agreement to stabilize the coffee industry was signed in Washington, D.C., on Nov. 28, 1940 by the United States and 14 coffee-producing nations of the western hemisphere, dividing on a quota basis the United States and world coffee markets among the producing states. Industrialization was to be promoted with a view to increase inter-American trade. It was reported from Chile that many factories were opening there to manufacture goods heretofore imported from Europe.

A reliable prognosis as to the course of international trade after the European and Asiatic wars is not possible. It is certain, however, that it will take years to rehabilitate the shattered economy of Europe. A hundred German experts have been reported to be working on a plan for organization of a superbank for international settlements in which all the nations of the world would settle their trade balances by some sort of a clearing system with periodical accounting. It was not known in 1940 in what way the balances would be settled at the end of a given period. The success of the plan is rather problematical, as it is to be based on the German barter system which runs counter to all principles of free exchange. It may be easy for a stronger country to force barter on a weaker country and profit by an arbitrary increase in the exchange value of its token money—as witnessed by the increase in the clearing rate of the German paper mark from 14.80 to 17.82 dinars in the trade with Yugoslavia. It is doubtful, however, whether independent nations would accept such a one-sided arrangement. The United States was able in 1940 to expand its foreign trade while carrying out an extensive program of national defence and the British were making strenuous ef-

SECRETARY OF STATE CORDELL HULL appeared before the house ways and means committee Jan. 11, 1940 to urge extension of the U.S. Reciprocal Trade Agreements act for three more years

forts to achieve a like end. If they succeed it will be easier to restore economic balance and order in the postwar world.

United States.—Table II shows exports, imports and balance of trade of the United States.

Table II.—*Balance of Trade of U.S., 1929 and 1934–40*
(All figures in millions of dollars)

Year	Merchandise		Excess of exports (+) or imports (—)		
	Total Exports*	General Imports	Merchandise	Gold	Silver
1929	5,241	4,399	+ 842	— 175	+ 19
1934	2,133	1,655	+ 478	—1,134	— 86
1935	2,283	2,047	+ 235	—1,739	—336
1936	2,456	2,423	+ 33	—1,117	—171
1937	3,349	3,084	+ 265	—1,586	— 80
1938	3,094	1,960	+1,134	—1,974	—223
1939	3,177	2,318	+ 859	—3,574	— 71
1939 (9 months)	2,185	1,621	+ 564	—2,885	— 59
1940 (9 months)	3,030	1,942	+1,088	—3,951	— 41

*Re-exports of imported merchandise are included.

The effects of the war on the business conditions in the United States were rather irregular, some unfavourable, but the foreign trade of the country was stimulated by the increased demand for American goods by the belligerents as well as by neutrals. The exports of merchandise, domestic and foreign, from the United States from Sept. 1939 to Aug. 31, 1940, were valued at $4,016,176,000 as compared with $2,941,073,000 for 1938–39, an increase of $1,075,103,000, or 36·6%. Exports to all continents were higher, the largest increase, both absolute and relative, being recorded in the trade with the other countries of the western hemisphere. Exports of American goods to the countries of the British empire aggregated $1,739,733,000 in value, representing 44·3% of the total in the first year of the war. The exports of American goods totalled $3,927,457,000, an increase of 35·29 over 1938–39. The principal increases were in the exports of metals and metal manufactures, $358,000,000; raw cotton, $165,000,000; aircraft, $157,000,000; machinery, $115,000,000; chemicals and related products, $86,000,000; lubricating oil, $39,000,000; firearms and ammunition, $39,000,000; coal, $38,000,000; merchant vessels, $35,000,000; paper and manufactures, $32,000,000. The exports of aircraft went up from $89,600,000 to $246,300,000. The principal decreases occurred in the exports of tobacco, $77,000,000; fruits and preparations, $34.000.000; automobiles and parts, $23.000.000; motor spirit, $22.000.000; crude petroleum, $15,000,000.

General imports totalled $2,625,321,000 as against $2,132,139,000 in 1938–39. Imports from Europe declined from $623,400,000 to $517,800,000; imports from the other continents were larger. Imports from the principal British countries rose from $660,600,000 to $959,800,000. Imports for consumption were valued at $2,528,680,000 in 1939–40 as against $2,110,711,000 in 1938–39. Increases were largest in the imports of rubber ($265,100,000 against $151,700,000), tin, raw silk, wool, furs, copper, sugar, newsprint, ferro-alloys, petroleum products, nickel, expressed oils and jute burlaps. There were minor decreases in the imports of chemicals, meat products, art works and machinery and vehicles.

In Sept. 1940 both imports and exports declined below the totals for August, but the value of the total trade for the first nine months of 1940, at $4,971,485,000, was higher than in any of the years 1937, 1938 or 1939. Trade with countries of the British empire totalled $1,481,000,000 in 1939 and $2,297,000,000 in 1940. Trade with the principal British countries showed the following increases in exports and imports: United Kingdom, $327,000,000 and $16,000,000; Canada $176,000,000 and $68,000,000; British East Indies, $30,000,000 and $133,000,000; British Africa, $22,000,000 and $30.000,000; Oceania, $14,000,000 and $2,000,000. United States trade with the soviet union for the first nine months of 1940 showed an increase of 62·2% over 1939. Exports to Russia were valued at $62,727,000 in 1940 and imports from Russia at $16,167,000. The principal American goods exported to Russia in 1940 were metal-working machinery, $18,219,000; other machinery, $7,051,000; refined copper, 108,956,000 lb. valued at $14,026,000; brass and bronze plates and sheets, 15,022,000 lb. value $3,054,000; and 3,142,749 bu. of wheat, value $2,634,000. The principal imports from Russia were furs and manufactures of furs, $10,230,000 and 291,642 tons of manganese ore, $3,732,000. United States exports to the 20 nations of Latin America increased from $362,425,000 in 1939 to $512,705,000 in 1940; imports from Latin America rose from $366,201,000 to $462,993,000. Exported goods showing the largest increases in value included iron and steel, aircraft, machinery, cotton, copper and alloys, paper, coal, wood pulp, lubricating oil, industrial chemicals and coal-tar products. Lower export values were recorded for wheat and flour, tobacco (reduced British purchases), fruits, motor spirit, crude petroleum gas and fuel oil and automobiles. Among the imported goods the highest increases in value were shown for crude rubber, tin, wool, copper, furs, manganese and chrome ores, jute burlaps, expressed oils, newsprint, gas and fuel oil and nickel. For most other articles the differences in value were small either way.

United Kingdom.—The higher average price level, rearmament activity and the general improvement in world economic conditions in 1937 resulted in an increase in British trade of more than 20% over 1936, bringing the 1937 total to the highest level since 1929. Industrial activity slackened in 1938 and foreign trade declined 10·6% below the total for 1937. The decline continued in 1939, amounting to 5·6% for the year. However, the trade values increased toward the end of the year, and the upward trend continued in 1940 when the war caused large increases in imports while successful efforts were made to maintain a steady flow of British exports. Table III shows a summary of British foreign trade.

Table III.—*Foreign Trade Values in United Kingdom*

Year	Total Imports (£1,000)	Exports of United Kingdom Goods (£1,000)	Exports of Imported Merchandise (£1,000)
1929	1,220,765	729,349	109,702
1934	731,414	395,986	51,243
1935	756,937	425,921	55,266
1936	847,752	440,605	60,769
1937	1,027,824	521,391	75,134
1938	919,509	479,755	61,525
1939	885,944	438,806	45,925
1939 (9 months)	655,606	336,709	38,675
1940 (9 months)	872,692	343,594	23,768

In the first nine months of 1940 the value of British trade was 20·3% higher in sterling than in the corresponding period of 1939. Imports were uniformly higher throughout the nine months, the total showing an increase of 33·1% over the previous year. The principal increases were in the imports of grain and flour, mineral oils, wool, raw cotton, vehicles, vegetable

res other than cotton and their manufactures (chiefly jute and jute gs), nonferrous metals, foodstuffs other than grain, iron and steel, ores d scrap metals and rubber. The imports of ships, aircraft and other icles rose from £3,337,000 to £20,017,000. Imports of the manufactures cotton, wool, silk and rayon declined £3,500,000, while imports of other tile manufactures (jute, etc.) were £8,600,000 higher. From the very ginning of the war the authorities recognized the importance of maintain- and, if possible, expanding the export trade to make easier the financing the abnormal import requirements. "The promotion of the greatest vol- e of export trade which can be achieved under the conditions of war" s the aim of the export council established by the British government in 0, 1940, and exporters were also assisted by the Export Credits Guarantee partment. The trade figures show the success of these efforts. Compared h 1939 the exports of British goods were higher in January, April, May d September of 1940 and lower in the other months, the total of £343,- 4,000 for Jan.–Sept. 1940 showing an increase of £6,885,000, or more n 2% over 1939. The exports of manufactured goods increased £17,300,- 0 in value, though the exports of machinery and vehicles had declined 5,100,000. This loss was outweighed by the increases in the exports of tiles, chemicals and related products, paper and cardboard, pottery and ss, electrical apparatus, hardware and cutlery. Exports of textile manu- tures, not including apparel, rose from £69,100,000 to £81,900,000; orts of chemicals, drugs and dyes from £17,000,000 to £23,200,000. The rease in the exports of manufactures was high enough to overcome the line of £9,300,000 in the exportation of raw materials, one-half of the ter loss being due to smaller exports of coal. A large increase in the orts of beverages was balanced by a corresponding decline in the value foodstuffs exported.

For the first 14 months of the war, Sept. 1, 1939–Oct. 31, 1940, imports alled £1,240,100,000; exports of British goods, £493,300,000; re-exports, 4,370,000. Corresponding figures for 1938–39 were: Imports, £1,021,- 0,000; British exports £525,400,000; re-exports, £59,900,000. The values the trade for Oct. 1940 were £85,100,000, £23,400,000 and £970,000, as npared with £61,900,000, £24,600,000 and £2,000,000, respectively, for . 1939.

Germany.—Foreign trade values for old and new Germany are sum- rized in Table IV.

Table IV.—*Foreign Trade Values in Germany*

Year	Imports (Rm. 1,000,000)	Exports (Rm. 1,000,000)	Excess of imports (—) or exports (+) (Rm. 1,000,000)
929	13,446.8	13,482.7	+ 35.9
933	4,203.6	4,871.4	+667.8
934	4,451.0	4,166.9	—284.1
935	4,158.7	4,269.7	+111.0
936	4,217.9	4,786.2	+550.3
937	5,468.4	5,911.0	+442.6
938	5,449.3	5,256.9	—192.4
"Greater Germany"*			
938	6,051.7	5,619.1	—432.6
938 (7 months)	3,456.8	3,282.3	—174.5
939 (7 months)	3,194.3	3,314.5	+120.2

rade of Germany and Austria, combined, with other countries. Beginning with Oct. 8, the trade of the Sudeten districts is also included, and since April 1, 1939, also the le of Memel. The trade of Bohemia and Moravia is not included.

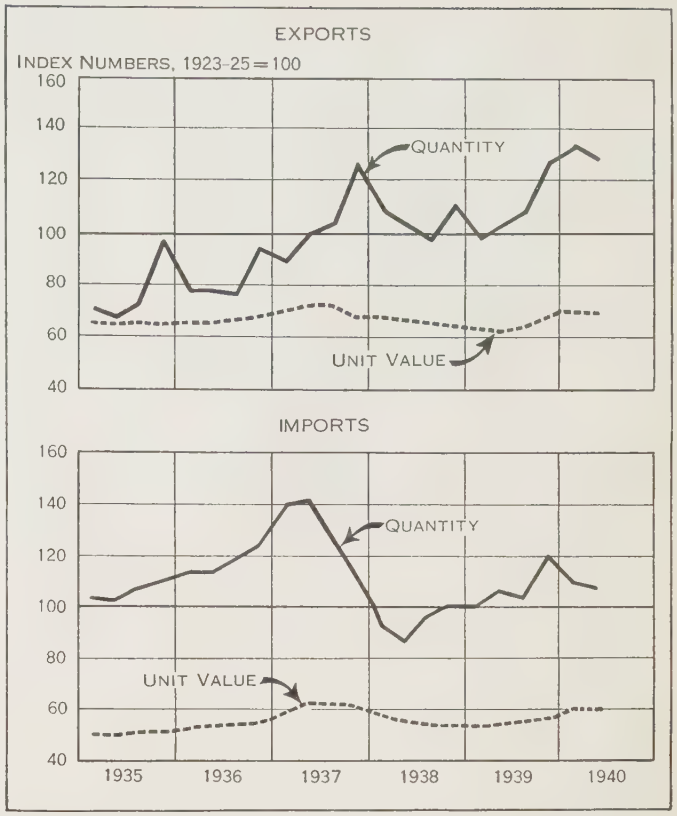
No official reports on the foreign trade of Germany have been issued ce July 1939. It is certain, however, that both the volume and the value the trade declined in 1940. For a number of years German economy had n based on preparation for war. Many of the war materials had to be ained abroad and foreign exchange reserved for such purchases reduced means available for the acquisition of foodstuffs and materials needed the peace industries. Thus the growing armament expenditures natur- y lowered the standard of living of the civilian population which re- ved guns instead of butter. When onions disappeared from the market, authorities blamed "an international Jewish hoarding plot." Trade with ersea countries was largely cut off by the blockade, while the trade with theastern Europe was continued in the form of a forced barter, with stronger partner dictating the terms. Even this trade declined in later nths, as it became more and more difficult for the harassed industries of rmany to make deliveries on time. Before the blockade it was possible

Table V.—*French Foreign Trade*

(All figures in millions)

Year	Imports		Exports	
	Francs	Dollars	Francs	Dollars
929	58,221	2,282	50,139	1,965
933	28,431	1,114	18,474	724
934	23,097	905	17,850	700
935	20,974	822	15,496	607
936	25,414	898	15,492	548
937	42,391	1,005	23,938	566
938	45,981	788	30,586	520
938 (8 months)	30,492	539	18,706	331
939 (8 months)	32,539	508	23,832	372

Germany, as its stocks of exportable goods dwindled, to keep its export gagements by re-exporting to one client goods obtained from another, is actively competing with the latter. In 1939, for example, more than e-tenth of the merchandise received by Bulgaria from Germany was of eign origin, including 8,816 metric tons of cotton, 1,147 tons of wool, ,991 tons of mineral oils, 559 tons of rubber, 563 tons of cacao beans, 5 tons of coffee, and other goods. Such re-exportation became impossible 1940 when the blockade stopped importation from oversea countries. At e same time exports to oversea were limited to a few air-mail shipments



INDEXES OF CHANGES in quantity and unit value (price) of total exports of United States merchandise and imports for consumption, by quarters—1935-40. Prepared in the Bureau of Foreign and Domestic Commerce

and deliveries by ships navigating little-used sea lanes. The trade of the United States, Argentina, Brazil, Chile, China, Philippines, Turkey and Egypt with Germany for the first 6 months of 1940 had a value of only $31,827,000, as against $283,103,000 for the corresponding period of 1939, a decline of 88.8% or more than seven-eighths. This loss could not be made good by the trade with southeastern Europe. The trade of Hungary with Germany for the first half of 1940 was valued at $82,869,000, an increase of only $10,922,000 over 1939. Rumanian trade with Germany had a value of $74,670,000 in 1940, an increase of $17,740,000. The chief Rumanian exports to Germany were 265,991 metric tons of mineral oils, 359,980 tons of grain and flour and 19,182 tons of animals and foodstuffs of animal origin. Imports from Germany had a higher value than exports to Germany in the case of both countries in the first half of 1940.

France.—Table V shows the value of French foreign trade (the depreciation of the franc has made it advisable to show statistics both in actual currency values and in gold dollars).

The unsettlement of internal financial, social and general economic conditions in France affected the foreign trade to an unusual degree. The conditions improved toward the end of 1938 and the improvement continued during the first six months of 1939 when the imports and exports averaged 4,192,000,000 and 3,007,000,000 francs a month. There was a recession in July and Aug. 1939 when the monthly averages declined to 3,887,000,000 and 2,896,000,000 francs respectively. The war resulted in a serious dislocation of French trade which cannot be shown in figures, however, as no reports on French trade have been issued since the outbreak of the war. In peace times France had done most of its trade, apart from the colonies, with the United States, the United Kingdom and three of its neighbours: Belgium, Germany and Switzerland. In 1937 these five countries supplied 34% of French imports and received 43% of French exports. The German market was cut off by the war; in some other markets France suffered from the increasing poverty of its clients, as most of French exports are quality goods and the United States became the chief supplier of the country. In the first six months of 1940 United States exports to France had a value of $252,395,000 as compared with $70,- 385,000 in 1939, while United States imports from France declined slightly from $33,000,000 to $30,000,000. In the same two half-yearly periods the trade of Argentina, Egypt, Turkey, Brazil and the Philippines with France increased, while the trade of Chile and China with France declined slightly, the total for the seven countries named increasing from $64,- 802,000 in 1939 to $84,235,000 in 1940. United States exports to France for the first year of the war had a value of $327,200,000 as against $156,- 100,000 for 1938–39 and imports from France were $50,900,000 as compared with $66,000,000 for 1938–39. In the three months, July to Sept. 1940, United States trade with France dwindled to $401,000 of exports and $2,673,000 of imports. The German invasion had devastated northern France where whole towns were destroyed and the so-called "requisitions" by the invaders caused widespread poverty and misery among the population. Transportation was demoralized by lack of fuel and lack of organization and the movement of merchandise both in domestic and foreign trade became increasingly difficult. The French port of Marseilles saw its once large trade reduced to traffic with French North Africa, and even this trade

was threatened by the shortage of fuel oil. In Aug. 1940 Marseilles was able to import only 116,000 tons and export 63,000 tons, just about one-fourth of the quantities handled in Aug. 1934.

Other Countries.—The foreign trade of Japan for the first six months of 1940 showed an increase of 21.9% in paper yen over the corresponding period of 1939. Trade with the European countries declined from 278,000,000 to 205,000,000 yen, while the trade with the other continents increased. It was doubtless due to the exigencies of war that Japanese exports to Manchoukuo, Kwantung and China rose from 725,000,000 to 1,014,000,000 yen, representing 54.5% of total exports as against less than 50% in 1939. The exports of cotton piece goods declined from 1,116,000,000 to 915,000,000 sq.yd., and large quantities were reported stored on godowns in the principal ports at the end of 1940. The exports of raw silk decreased from 21,372,000 to 14,731,000 lb. but the value rose from 167,000,000 to 193,000,000 yen. Imports of rice and wheat, coal, phosphates and metals were higher in value. Imports of raw cotton declined from 643,207,000 to 540,068,000 lb., the value rising from 218,000,000 to 266,000,000 yen.

In the trade of India imports for the first six months of 1940 were valued at Rs. 920,000,000 and total exports at Rs. 1,242,000,000, as against Rs. 857,000,000 and Rs. 868,000,000, respectively, in 1939. Nearly two-thirds of the increase in the value of exports was due to the larger sales of jute and jute products (great demand for sandbags in Great Britain). The exports of raw jute increased Rs. 51,000,000 in value; gunny cloth, Rs. 88,000,000 and gunny bags, Rs. 105,000,000. Exports of tea rose from Rs. 56,000,000 to Rs. 78,000,000, and exports of tanned or dressed hides and skins from Rs. 28,000,000 to Rs. 50,000,000.

The foreign trade of Argentina showed smaller quantities and higher values in 1940 for both imports and exports. Coal, wood and iron accounted for the quantity decline in imports; maize, linseed and forest products in exports. The trade lost by the closing of European markets represented about 40% of Argentine exports and a slightly higher percentage of imports. The exports of linseed declined from 756,279 to 613,676 metric tons and the exports of maize from 1,671,218 to 1,364,788 tons, the price declining from 62.75 to 48.86 pesos a ton. A part of the large surplus of maize was sold for fuel. Argentine exports to Germany in 1940 declined 67,800,000 pesos, while the exports to Italy and Spain increased 51,405,000 pesos, a part of that increase probably going to Germany.

Chilean exports of copper increased from 1,464 to 2,061 quintals in quantity and from 138,700,000 to 231,000,000 pesos in value.

Exports of sugar and tobacco from the Philippines were much smaller in 1940.

Egypt imported only 15,766 gas masks in 1940 as against 173,007 in 1939. The exports of Egyptian cotton decreased from 206,733 to 175,632 metric tons, the value rising from £E.11,676,000 to £E.14,233,000.

France, Germany, Italy and the soviet union have not issued any trade reports for 1940. (*See* also TRADE AGREEMENTS.) (J. J. K.)

Interstate Commerce Commission: *see* GOVERNMENT DEPARTMENTS AND BUREAUS.

Intoxication, Alcoholic. In the treatment of acute alcoholism the administration of fructose and glucose enhances the disappearance of alcohol from the blood, whereas galactose delays it. The ingestion of food appears to have a specific effect upon the metabolism of alcohol, but diminishes its absorption rate. Fats have the greatest influence in diminishing the absorption rate.

A preponderance of evidence indicates that muscular work does not greatly affect the rate of disappearance of alcohol from the blood. Insulin produces some increase in the rate of its absorption, but it is more effective when combined with glucose. Its disappearance is unmodified by caffeine or atropine; adrenalin appears to interfere with the absorption rate; thyroxin with its oxidation; but pituitrin reduces the alcohol level in the blood. Some authors are impressed with the effectiveness of benzedrine in the treatment of acute alcoholism.

British literature witnessed the appearance of a new *Quarterly Journal of Studies on Alcohol.* It was published in the United States. The first two issues of Volume I contain numerous articles wherein special phases of the problem of alcoholism are reviewed. These articles serve as a fundamental base line for evaluating the present status of knowledge on different aspects of the problem.

The medical literature of the year, as in previous years, was still concerned with the concept that chronic alcoholism is a medical problem. Nevertheless, social sanction for the consumption of alcoholic beverages is a potent factor in the production of alcoholism. The solution of the problem rests, not upon medical knowledge alone, but upon a large and diversified body of information with which the promotion of human welfare is concerned. Of great significance in this direction was the enactment of legislative control measures wherein the sale and distribution of alcohol, with its present moral, profit and revenue motivation, would no longer obscure its medical, sociological and economic significance. There was, as in previous years, a trend in medical literature to regard the problem of the habitual drunkard as representing a distortion in personality function.

Even in those alcoholic mental disorders, long considered as due to conditions that interfere with brain cell nutrition, such for example as delirium tremens, the role of individual constitutional psychogenic factors in relation to habitual drunkenness is being given greater value.

The role of vitamin deficiency in chronic alcoholism continued to command attention, with the consensus that it is an important factor in the production of disabilities seen among chronic drinkers. A diet with high caloric values, supplemented by vitamins, is a recognized principle of treatment.

Further interest was shown in the possibility of contra-conditioning chronic alcoholic patients through the substitution of either a conditioned reflex of nausea and disgust for alcohol or other substitute conditionings having greater emotional significance.

The state legislature of California authorized the establishment of a tax-supported inebriate colony for the segregation and treatment of alcoholics and contemplated its development in 1941.

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Inventions: *see* PATENTS.

Iowa, north-central state of the United States, popularly known as the "Hawkeye state"; area 56,147 sq.mi.; population (U.S. census, 1940) 2,538,268. Capital, Des Moines, 159,819 (the only city in Iowa with a population over 100,000). Of the state's population in 1940, 1,084,231 or 42.7% were classified by the federal census as urban. By Jan. 10, 1941, 24,0[illegible] aliens had registered in Iowa under the alien registration act.

History.—The officers elected on Nov. 5, 1940, who took office in Jan. 1941, were: governor, George A. Wilson (re-elected); lieut. gov., B. B. Hickenlooper; auditor, C. B. Akers; treasurer, W. G. C. Bagley; secretary of state, Earl G. Miller; secretary of agriculture, Mark G. Thornburg; attorney general, John M. Rankin; and superintendent of public instruction, Jessie M. Parker. All are Republicans. In the presidential election Willkie received 632,370 votes and Roosevelt, 578,800. A state conservation commission, a state board of social welfare, a state commerce commission and an Iowa unemployment compensation commission are also a part of the state administration. Members of the commerce commission are elected by popular vote. Members of other boards are appointed by the governor. The nine members of the state supreme court are elected for terms of six years. The state highway commission is located at Ames, Ia.;

e other boards and commissions have their headquarters at Des oines. Funds for the state are provided by taxes on property, comes, retail sales, corporations, gasoline (state tax three cents r gal.) and inheritances. There are limited exemptions on home-eads. By July 1, 1940, 5,208·2 mi. of primary roads of Iowa ere paved and 3,263·4 mi. were gravelled or otherwise surfaced. the secondary road system, 38,848 mi. were gravelled by Jan. 1940 and 42 mi. were paved.

Education.—The superintendent of public instruction reported r the school year, 1938–39, 8,795 rural schools in Iowa, 1,447 aded schools and 950 approved high schools. The total number children of school age (5–21 years) was 681,297. Of these 9,200 were enrolled in the public schools and 2,126 in public nior colleges. The teachers in the public schools, exclusive of nior colleges, numbered 26,051 and the cost of the public nools was $52,629,116·24, three-fourths of which was raised by e general property tax in local districts. Iowa ranks first among e states in literacy with only ·8 of 1% illiterate.

Charities.—A state board of social welfare, composed of three embers appointed by the governor (King R. Palmer, chairman), ministers old age assistance, aid to the blind, aid to dependent ildren, child welfare and emergency relief. Working with it e local boards in the 99 counties. For the year 1939–40 the ate appropriated $7,000,000 for old age pensions. The board control (D. R. McCreery, chairman) has charge of the state's hal, correctional and eleemosynary institutions. Statistics r these as of Dec. 31, 1940, were as follows: men's reformatory, amosa, 1,118; state penitentiary, Fort Madison, 1,390; women's ormatory, Rockwell City, 66; training school for boys, Eldora, 2; training school for girls, Mitchellville, 167; state juvenile me, Toledo, 221; soldiers' home, Marshalltown, 481; and sol-rs' orphans' home, Davenport, 438. The four state hospitals the insane had 6,450 inmates and the institutions for the ble-minded and epileptics had 3,283.

Banking and Business.—There were 106 national banks, 299 vings banks, 245 state banks and 1 trust company doing busi-ss in Iowa in 1940. On Dec. 31, 1940, the 545 state institutions d total deposits of $465,328,868.62, an increase of $64,005,-0.78 over those of June 30, 1939. On June 30, 1940 the de-sits in the national banks totalled $250,253,000. Approximately % of the deposits in state banks and 56% of those in national nks were protected by government insurance. Prices of farm oducts through Oct. 1940 decreased 1·8% from those for the ne period of 1939, but farm income increased 10·4%.

Electric power production for the first ten months of 1940 owed an increase of 2·2% over that for the same period of 1939 d new automobile sales increased 10·8%. Building contracts of kinds for Jan.–Nov. 1940 increased 8·4%, residence building ntracts, 32·9%, business building contracts, 81·4%, department re sales, 3·4%, employment, 5·6%, industrial pay rolls, 5·1% d bank debits, 6·5%. Public building contracts decreased 9·1%.

Agriculture.—There were 210,343 farms in Iowa in 1940 with ,249,055 ac. of land. About 56·5% of this land was farmed by ants. Crops in Iowa were generally good in 1940. The figures the table indicate the production and value of the principal ops for 1940 as reported at the close of October. The use of brid seed corn and better farming methods increased the erage yield of corn from 35·5 bu. per ac. for 1928–37 to 52 bu. r ac. in 1939.

On Jan. 1, 1940 there were 9,651,000 hogs on Iowa farms, 844,000 sheep, 4,688,000 cattle, 752,000 horses and 54,000 mules. The total cash income of Iowa farmers for Jan.–Oct., 1940 was 64,206,000, as compared with $659,359,000 for the year 1939. the income for the first ten months of 1940, $416,039,000 me from livestock, $119,430,000 from crops and $28,737,000 from government payments. On Jan. 1, 1940, there were 18,840 auto trucks, 117,833 tractors and 20,029 mechanical corn pickers on Iowa farms. Some 50,500 farm homes were reported as electrified in June 1939. (R. A. Ga.)

Production and Value of the Principal Crops in Iowa in 1940

Crop	Acres	Production	Value
Corn	9,031,000	460,581,000 bu.	$267,137,000
Oats	5,166,000	206,640,000 bu.	55,793,000
Hay (all tame)	4,381,000	6,572,000 tons	39,432,000
Hay, wild	137,000	151,000 tons	785,000
Wheat	341,000	8,121,000 bu.	5,441,000
Barley	462,000	14,553,000 bu.	5,539,000
Rye	40,000	740,000 bu.	266,000
Potatoes	60,000	6,120,000 bu.	4,284,000
Soybeans (beans)	733,000	15,026,000 bu.	10,518,000
Soybeans (hay)	764,000	1,146,000 tons	*

*Soybean hay is included in All Tame Hay above.

Iowa, State University of. First state university to admit women on equal standing with men. It is in Iowa City, a community of 17,000 persons, 55 mi. west of the Mississippi river. Iowa's first general assembly established the university Feb. 25, 1847.

Enrolment in 1940 for the fifth time passed the 10,000-mark, although the figure of 10,685 for the 12 months ending in June 1940 was short of the record established three years before. A record total of campus students, 6,888, enrolled for the first semester of 1940–41. Degree awards totalled 1,716, including 645 advanced degrees.

When the $90,000 radio transmitter and studios were dedicated, it was announced that WSUI led all educational stations in air time per week. Nuclear physics research was aided by construction of a $25,000 atom-smasher, and a $25,000 wing to East hall to house the journalism school was started.

Gifts and grants in 1940 totalled $73,120, bringing the five-year total to over $1,600,000. In the nine colleges and five schools, a staff of 638 persons gave instruction.

Iowa State College. Iowa's land-grant institution at Ames during 1940 made marked progress in a number of its facilities for research and instruction in agriculture, engineering, home economics, science and veterinary medicine. Two new buildings were completed during the year. A gymnasium for women, constructed at a cost of $250,000, provides the college's first adequate facilities for physical education for women. The other, the Collegiate Press building, houses a printing plant and offices and workrooms of five student publications. It is unique in that its construction cost was financed entirely from the earned reserve funds of those student journalistic activities. Some 200 ac. of land were added to the college recreation area to provide facilities for winter sports. A grant from the Rockefeller foundation made possible the study of two basic problems of genetic research. One of these is the discovery of the basis of hybrid vigour. In the year ending in June 1940, resident enrolment in Iowa State college reached a new high of 7,969 students, including 2,798 women and 1,108 graduate students. (R. W. Be.)

Iran, known before March 1935 as Persia, a country of western Asia bounded to the east by India and Afghanistan, to the north by the U.S.S.R., to the west by Iraq and Turkey, and to the southwest and south by the Persian gulf and Arabian sea; ruled since 1926 as a constitutional kingdom by Reza Pahlevi Shah (*b.* 1878); premier, A. Martine Daftori (Oct. 31, 1939). Area, 634,360 sq.mi.; pop. (est.), 15,000,000. Chief towns: Teheran (cap., 360,000), Tabriz (220,000), Meshed (140,000), Shiraz (120,000), Isfahan (100,000). Language, Persian; religion, Mohammedan.

History.—Throughout 1940 Iran maintained her resolve to keep out of the war, but at the same time to defend herself if attacked. For the greater part of the year she envisaged only one possible invader, namely, Russia, and she did her utmost to prevent any friction with her great northern neighbour. As a signatory to the Saadabad pact of 1937—the other members being Turkey, Iraq and Afghanistan—she kept a vigilant eye on any deterioration of the middle east position. Officially neutral, Iran denied repeatedly that Teheran was being made the focus of axis intrigue in the middle east. That allegation, however, continued to find credence in various quarters. (K. Wi.)

Banking and Finance.—Revenue, ordinary (est. 1938–39), 1,528,400,000 rials; (est. 1939–40) 1,930,096,000 rials; expenditure, ordinary (est 1938–39), 1,527,500,000 rials; (est. 1939–40) 2,613,482,000 rials; foreign loan (May 15, 1939), £991,120; public debt (Dec. 31, 1938), 98,900,000 rials; note circulation (May 31. 1939), 856,000,000 rials; gold reserve (May 22, 1939), 310.949,000 rials; exchange rate rials, 80.50=£1 sterling.

Trade and Communication.—Foreign trade (merchandise) 1937–38: imports, 1,394,878,000 rials; exports, 2,559,881,000 rials. Communications 1938: roads fit for wheeled traffic, *c.* 8,700 mi.; railways open to traffic, 1,072 mi.

Agriculture and Minerals.—Production, 1936–37 (in metric tons): petroleum, crude (1938), 10,359,000; wheat, 2,159,560; barley, 882,564; rice, 398,510; beetroot, 135,940; cotton, 122,480; wool, 12,963; beet sugar (1937–38), 26,100; tobacco (1937–38), 15,900.

Iraq, an Arab state of the near east, between Iran, Syria and Arabia, watered by the Tigris and Euphrates; an independent kingdom since 1932, when the British mandate was terminated. Area, 116,000 sq.mi.; pop. (est. Dec. 31, 1938), 5,000,000. Chief towns: Baghdad (capital, 400,000), Mosul (260,000), Basrah (180,000). Ruler: King Feisal II; regent: Prince Abdul-Ilah; premier: Sazid Rashid el Gailani; language: Arabic; religion: Mohammedan.

History.—Of all the independent middle eastern countries, in 1940 Iraq showed, superficially, the least stability. The youthfulness of her king, Feisal II; the apparent insecurity of her government; anxiety over the development of Palestine; preoccupation over the fate of Syria; the menace to her ally, Britain, to Turkey and to Egypt; the restriction of her oil output and the consequent drop in her royalties—all these things had a profoundly disturbing effect. But the Iraqis not only held fast to their international loyalties but also contrived to maintain a precarious continuity of administration. To the propaganda of Berlin and Rome they gave little hospitality.

With so new a nation as Iraq, domestic considerations naturally were apt to overweigh international matters. This fact showed itself in the much-increased interest in the possibility of reaching union with other Arabs. With the collapse of France and the subsequent uncertainty of Syria's future, the Iraqis became more than ever concerned with the fate of their brothers under French mandate. They, like the Turks, were determined that, whatever happened to Syria, it should not fall under new alien dominion—many of them would fain have had it incorporated in Iraq.

Of Iraq's foreign policy it may be said to have closely resembled that of Turkey. (K. Wi.)

Education.—In 1938: elementary schools, government, 741; scholars, 94,368; new schools opened 1938–39, 22; secondary schools, 14; scholars, 1,904; intermediate schools, 48; scholars, 10,611.

Banking and Finance.—Revenue, ordinary (actual 1938–39), 5,686,050 dinars; (est. 1939–40) 6,033,000 dinars; expenditure, ordinary (actual 1938–39), 5,493,265 dinars; (est. 1939–40) 5,994,632 dinars; public debt (Dec. 31, 1938), 1,000,000 dinars; notes in circulation (June 30, 1939), 4,200,000 dinars; foreign assets reserves, £4,600,000 sterling; exchange rate (currency based on sterling): 1 dinar=£1 sterling.

Trade and Communication.—Foreign trade 1938 (merchandise): imports, 9,361,004 dinars; exports, domestic, 3,472,369 dinars; foreign produce, 216,466 dinars. Communications 1939: roads, main routes, 3,130 mi.; railways, open to traffic, 752 mi.

Agriculture and Minerals.—Production 1938 (in metric tons): petroleum, crude, 4,272,000; wheat, 600,000; rice, 360,000; barley (1937), 570,000; tobacco, 4,000; wool (1937), 7,200; cotton, 2,900.

Ireland: *see* Eire.

Ireland, Northern. Northern Ireland comprises the six Ulster counties of Antrim, Armagh, Down, Fermanagh, Londonderry and Tyrone, forms part of the United Kingdom of Great Britain, but (since 1920) has its own parliament and executive, though also represented in the imperial parliament by 13 members. Ruler and national flag, as for Great Britain. Governor: the duke of Abercorn; premier: Rt. Hon. Viscount Craigavon, till Nov. 24, 1940; John Miller Andrews, thereafter.

Area and Population.—Area, 5,238 sq.mi.; pop. (June 30, 1938), 1,285,000. Chief towns (pop. census 1937): Belfast (capital, 438,086), Londonderry (47,813). Language: English; religion: Christian (Roman Catholic, 33·75%; Presbyterian, 31·4%; Episcopalian, 27%).

History.—War conditions necessitated the introduction during 1940 of supplementary budgets. The budget introduced on Aug. 5 made provision for a contribution of £6,000,000 to the imperial exchequer, compared with a peacetime figure of £2,000,000.

At the end of September the war savings campaign, inaugurated in Nov. 1939, had raised £3,169,000—£1,825,000 representing Ulster savings certificates (national defence issue) and £1,344,000 defence bonds.

Agricultural production was substantially increased. The tillage campaign, powerfully stimulated by the ministry of agriculture, resulted in the plowing-up of 262,000 ac. of old grassland. The flax acreage was increased from 21,000 to 46,500, the barley acreage from 2,000 to 17,000 and the wheat acreage from 3,000 to 11,000. The 1941 program provided for an additional 200,000 ac. under crops and the increase of the flax acreage to 100,000.

Many of Northern Ireland's industrial establishments were engaged on large contracts for war supplies. The linen industry was seriously affected by the shortage of flax and the consequential restrictions on consumption in the home market. Supplies of flax for general export purposes and for meeting the special requirements of the U.S.A. market were placed at the disposal of the industry. Linen exports were therefore increased in value and thus helped materially in the vital task of maintaining and increasing foreign credits. Other valuable items of export were machinery, whisky, ropes, twine and cordage. (*See* Linen and Flax.)

An investigation was being conducted into Northern Ireland's resources of bauxite and iron ore. The indications were encouraging. Social services were fully maintained. The Old Age and Widows' Pensions bill provided for supplementary pensions based on household needs and also improved the position of insured women in respect of their age qualification.

The newly-formed ministry of public security had control of civil defence, including the organization of air-raid precautions and the administration of the regular and special constabulary and the local defence volunteers. In local government a policy

retrenchment enforced by war conditions necessitated the sus-
nsion of nonurgent schemes. Local authorities were liberally
sisted by state grants in A.R.P. services. (R. D. B.)
Viscount Craigavon's death on Nov. 24 was mourned through-
t the British isles. He was succeeded as premier on Nov. 25 by
hn Miller Andrews, the minister of finance.

Education.—In 1938: elementary schools, 1,700; scholars, 191,-
2; secondary schools, 76; scholars, 14,557; universities, stu-
nts, 1,590.

Banking and Finance.—Revenue (1939–40), £18,204,542;
st. 1940–41) £20,006,000; expenditure (1939–40), £16,084,924;
st. 1940–41) £16,266,000.

Trade and Communication.—External trade 1938: imports,
4,385,000; exports, £51,061,000. Communications 1939: roads
for motor traffic, 13,043 mi.; railways, standard gauge, 741
.; narrow, 121 mi.; canals, 180 mi.

Agriculture and Manufactures.—Production 1938 (in tons):
tatoes, 491,000; oats, 22,700; wheat, 3,850; flax, 4,036; bar-
, 1,025. Livestock (1939): cattle, 700,564 head; sheep, 551,-
2 head; pigs, 565,726 head; poultry, number, 6,038,000. Ship-
ilding, tonnage launched (1938), 79,468; value of linen goods
ported 1938, £5,480,000.

ish Free State: *see* EIRE.

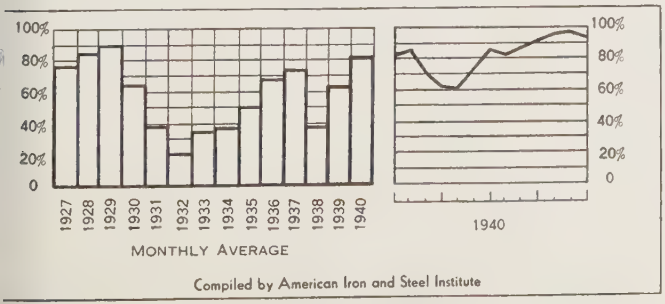
on and Steel.

Discussion of the iron and steel industry can for the most part be handled more isfactorily subdivided into its three main headings—iron ore, iron and steel. Production tables under each of these head-gs include all countries in which production of the commodity question has materially exceeded 1,000,000 tons, giving a verage which in general accounts for 93–98% of the world als. Production data having been suppressed since Sept. 1939 most countries outside of the United States, such later fig-es as are presented are largely estimates.

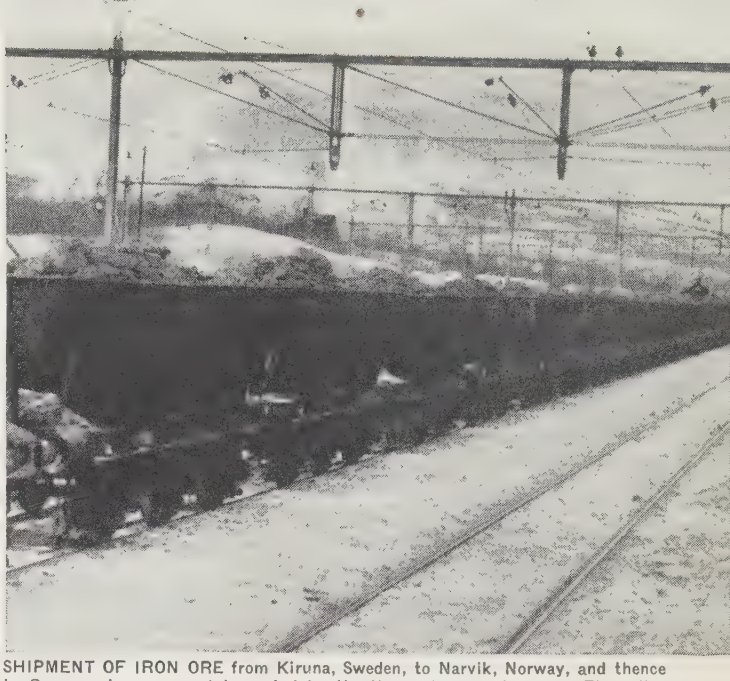
Iron Ore.—Statistics on world iron ore output were so frag-ntary after 1938 that it is useless to attempt to estimate the als, but it may be assumed that these followed the same gen-l trend as with pig iron, for which increases over the pre-ding year were 24% in 1939 and 4% in 1940. United States out-t increased by 43% in 1940, to 73,800,000 tons; and shipments e 37%, to 75,000,000 tons. The bulk of the increases was m the Lake Superior district, as other areas increased only % in output and 20% in shipments.

The most important feature of the world industry was the ex-nt to which the war changed the normal distribution of iron ore plies in Europe, of which more will be said in the discussion steel.

Pig Iron.—World production of pig iron increased by 24% in 39 and by 4% in 1940. Most of the countries actively involved the war showed declines in output, but these were more than set by an increase of 33% in the United States. The only untry to make a new record high in 1940 was the soviet union;



EEL PRODUCTION in the United States: percentage of capacity



SHIPMENT OF IRON ORE from Kiruna, Sweden, to Narvik, Norway, and thence to Germany by sea was interrupted by the Norwegian war in 1940. Thereafter the victorious Germans worked rapidly to restore this vital supply line

the world total also made a new record, at 104,000,000 tons.

Steel.—World steel production rose by 26% in 1939 and by 16% in 1940, to a new record high at 159,800,000 tons; the outputs of the United States and the soviet union were also new records. On the whole, the belligerent countries maintained their steel outputs better than that of pig iron, but practically all had small declines, leaving the United States chiefly responsible for the increased world total.

War and Steel.—As soon as it became inevitable that war would develop in Europe, it became equally inevitable that there would be a complete rearrangement of the normal distribution system for the raw materials required in the production of steel, primarily iron ore, for both Britain and Germany were dependent on outside sources, the former for one-third and the latter for two-thirds of the normal supply. At the outset, Britain, with France as an active ally, was in the more favourable position, for while importation from the more remote sources of supply (Newfoundland, Tunisia and Algeria) was hampered by transpor-

Table I.—*World Production of Iron Ore*
(In millions of long tons)

	1929	1932	1937	1938	1939
North America—					
Newfoundland	1.5	0.1	1.6	1.7	1.7
United States	73.0	9.8	72.1	28.4	51.7
South America—					
Chile	1.8	0.2	1.5	1.6	1.6
Europe—					
Austria	1.9	0.3	1.9	2.6	?
Czechoslovakia	1.8	0.6	1.8	?	?
France	49.9	27.2	37.3	32.6	?
Germany	6.3	1.3	9.4	10.8	?
Luxembourg	7.5	3.2	7.6	5.0	?
Spain	6.4	1.7	1.0	2.5	?
Sweden	11.3	3.2	14.7	13.7	?
U.S.S.R.	6.9	12.0	27.6	26.0	?
United Kingdom	13.2	7.3	14.2	11.9	?
Asia—					
China	2.6	2.2	?	?	?
India	2.4	1.8	2.9	2.8	?
Malaya	0.8	0.7	1.7	1.7	?
Africa—					
Algeria	2.2	0.5	2.3	3.0	2.7
Morocco (Span.)	1.2	0.2	1.4	1.3	?
Australia	0.9	0.6	1.9	2.3	2.6
World Total	200.0	75.0	214.0	161.0	?
Ex. U.S.A.	127.0	65.2	142.0	132.0	?
Ex. British	191.1	64.3	191.6	139.5	?
Brit. Empire	18.9	10.7	23.4	21.5	?

Table II.—*World Production of Pig Iron*
(In millions of long tons)

	1929	1932	1938	1939	1940
North America—					
Canada	1.2	0.2	0.7	0.8	1.0
United States	42.6	8.8	19.2	31.8	42.4
Europe—					
Belgium	4.0	2.7	2.4	3.0	2.2
Czechoslovakia	1.6	0.4	1.2	0.3	...
France	12.3	6.8	6.0	7.8	4.6
Germany	13.2	3.9	18.2	21.7	20.6
Luxembourg	2.9	1.9	1.5	1.8	1.1
U.S.S.R.	4.0	6.3	14.8	15.0	15.3
United Kingdom	7.6	3.6	6.8	8.2	8.3
Asia—					
India	1.4	0.9	1.5	1.8	?
Japan	1.5	1.5	3.1	3.3	3.0
World Total	97.2	39.2	80.5	100.0	104.0
Ex. U.S.A.	54.6	30.4	61.2	68.2	61.6
Ex. British	86.7	34.3	70.3	88.5	91.6
Brit. Empire	10.5	4.9	10.2	11.5	12.4

tation difficulties, France, Sweden and Norway were still accessible. On the other hand, Germany lost ready access to three-quarters of her imports and half of her total supply of iron ore, for not only was France entirely closed to her, but the even more important Swedish supply was hard to secure, as during the winter months shipment could be made only through Norway and the North sea, the inside route through the Gulf of Bothnia being closed by ice. But as the war progressed, the conditions were gradually reversed by the occupation of Poland, Belgium, Luxembourg and Norway, the economic domination of Sweden and finally the fall of France. At the end of 1940 Germany was in command of sufficient sources of supply to cover her needs for ore, while Britain was deprived of access to all of the neighbouring sources and was forced to rely on the remote sources and imports of steel from the United States. By successive occupation of the various areas, Germany secured control of a total steel making capacity just about equal to that of her own prewar area; in other words, her potential steel supply was approximately doubled and there were ore supplies available to make it effective, though of course it is questionable to what extent production could be maintained in the occupied areas, where operation would to a considerable extent be with what amounted to forced labour. On the opposing side, the production capacity of Poland was soon lost and that of France followed later, leaving only the British output, and that handicapped by the remoteness of the available sources of ore supply needed to make up the deficit in the domestic output. It was this condition of affairs that so tremendously increased the demand for United States steel to supplement the

Table III.—*World Production of Steel*
(In millions of long tons)

	1929	1932	1938	1939	1940
North America—					
Canada	1.4	0.3	1.1	1.3	2.0
United States	56.4	13.7	28.7	47.7	60.2
Europe—					
Belgium	4.0	2.7	2.2	3.0	2.2
Czechoslovakia	2.2	0.7	1.7	0.4	...
France	11.7	6.9	6.1	8.4	5.4
Germany	16.0	5.7	22.9	26.4	25.1
Italy	2.1	1.4	2.3	2.7	2.5
Luxembourg	2.7	1.9	1.4	1.8	1.3
Poland	1.4	0.5	1.5	1.6	?
Sweden	0.7	0.5	1.0	1.1	0.9
U.S.S.R.	4.6	5.7	18.2	18.5	19.5
United Kingdom	9.6	5.3	10.4	13.5	13.4
Asia—					
Japan	2.3	2.4	5.9	6.3	6.3
World Total	118.1	49.9	107.1	134.6	159.8
Ex. U.S.A.	61.7	36.2	78.8	86.9	99.6
Ex. British	106.1	6.4	93.0	117.3	141.3
Brit. Empire	12.0	43.5	14.1	17.3	18.5

British supply from domestic sources, and the necessity that it be supplied promptly and liberally, for the importation of one ton of steel saves the importation of two tons of ore, and at the same time relieves the domestic smelting industry of some of its overload. (*See* also STRATEGIC MINERAL SUPPLIES.)

As a result of this emergency demand, exports of pig iron, scrap and steel from the United States to Britain during 1940 were in excess of 3,500,000 tons, over 70% of which was in the second half of the year, and in 1941 this amount might be expected to double. On top of the British demand, there was additional home demand for the defence program and this in 1941 was expected to reach about the same figure as the British demand. Together these amounted to about one-quarter of the 1940 output, indicating a possible demand in 1941 that might be of the order of 70,000,000 to 75,000,000 tons, which, incidentally, is just about the rate at which production was being turned out at the end of 1940. This being the case, there seemed in 1940 to be no need to fear that the steel industry of the United States would not be able to meet the double load that was being placed upon it without detriment to the regular domestic consumption, especially since production capacity had already risen from 62,500,000 tons at the end of 1939 to 70,000,000 tons in Nov. 1940, according to official reports from the industry, while an unofficial estimate made in Jan. 1941 placed the capacity at 76,000,000 tons, with more additions still under way. (*See* also FLUORSPAR; METALLURGY.) (G. A. Ro.)

Iron and Steel Institute, American: *see* AMERICAN IRON AND STEEL INSTITUTE.

Irrigation. At the close of the rainfall season of 1940, the federal irrigation water supply forecasts predicted a subnormal irrigation water supply for all the irrigated areas of the United States except the northern and central sections of California. This prediction was generally borne out, but because of these early season forecasts farmers were guided in planning early or late maturing crops as conditions warranted, with the result that there were no widespread crop failures and relatively few crop shortages due to insufficient irrigation supply. Federal irrigation projects on which relief funds could be expended continued to be the most active of the irrigation enterprises, although some of these funds were also expended for water-conservation works on semipublic irrigation districts.

During 1940 federal irrigation projects constructed by the bureau of reclamation were prepared to serve more than 106,000 ac. of land not previously served. More than 23,000 ac. were opened for settlement, providing new homes for approximately 261 farm families dislocated by drought or other misfortunes. Under the construction program of the bureau, water will be provided for about 2,500,000 additional acres of new land and about 3,500,000 ac. now insufficiently irrigated, to support another million people.

During the year work was in progress on 27 federal irrigation projects in 13 states. The Roza diversion dam on the Yakima river in Washington; the Seminoe and Grassy Lake storage dams in Wyoming; the Boca storage dam in California and the Fresno dam in Montana were completed. At the close of the year there were being constructed the Grand Coulee dam on the Columbia basin project, Washington; the Shasta and Friant dams on the Central valley project, Calif.; Marshall Ford dam, Colorado river project, Tex.; Green Mountain dam, Colorado-Big Thompson project, Colo.; Deer Creek dam, Provo river project, Utah; Wickiup dam, Deschutes project, Ore.; and the Crane Prairie dam, Deschutes project, Ore. The Friant and Crane Prairie dams were begun during the year. Grand Coulee dam, when completed

'ill be the largest concrete dam in the world, while Shasta will e second, Friant fourth and Marshall Ford fifth. On July 1, 940, storage reservoirs of the bureau of reclamation had a com- ined capacity of 51,215,000 ac. ft.

All-American Canal.—This canal, constructed by the bureau of :clamation for the Imperial irrigation district (Calif.), com- ienced delivery of water in Oct. 1940, but the canal will not be ı full operation until 1942. The main canal to serve the Impe- al valley is 80 mi. long with capacities ranging from 15,155 to 755 sec. ft. Its construction included the excavation of approxi- ıately 65,000,000 cu.yd. of material and building of the Imperial ım and desilting works. At about mile 40 on the main canal, a ranch canal some 135 mi. in length is under construction to :rve the Coachella valley of Riverside county, Calif. It will be :veral years before this unit is completed.

Under full development the All-American canal will be capable supplying water for the irrigation of the 800,000 ac. in the ılarged Imperial irrigation district and about 150,000 ac. in the oachella Valley County water district.

During the year the Imperial irrigation district completed the :st unit of a system to utilize the power possibilities of the All- :merican canal. This unit includes two hydro-electric plants at :ops on the canal with a total net capacity of about 14,500 kw. diesel stand-by plant with a total net capacity of 12,000 kw. ıd over 1,200 mi. of a transmission and distribution system :livering power to all parts of Imperial valley, both urban and ıral. About 60,000 kw. can be developed on this canal.

Canada.—In Alberta and Saskatchewan only minor new developments :re completed or actively inaugurated during 1940. The Leavitt project, king water from Belly river in southwestern Alberta and supplying 4,000 . of land, was completed. A number of small projects utilizing local airie supplies to irrigate from a few acres to a few hundred acres each :re completed or in process of completion.

Surveys and investigations of the Lethbridge southeastern project (in berta) to extend the irrigable area by about 300,000 ac. continued. Sur- ys were completed for the McLeod irrigation project, taking out of the ain canal of the Lethbridge northern irrigation district, by pumping, to rigate 10,000 ac. of land.

All of the above works are under the Prairie Farm Rehabilitation act, lministration offices of which are in Regina, Sask.

Netherlands.—Activities in building the second polder of the Zuider Zee ıclamation scheme were continued in 1940 and it is presumed that the ccupation of the country by foreign forces did not stop the reclamation ork, for reasons of unemployment relief and the creation of productive nd.

During the days of actual warfare in Holland, the main dike between orth Holland and Friesland, which encloses the Ijsel-lake and made the ıilding of polders possible, was not destroyed, notwithstanding some :rce fighting at the Friesland end of the dike.

India.—The Thal irrigation project, which was taken in hand immediately ter the opening of the Haveli project, is designed to irrigate from the ıdus over 1,000,000 ac. of land in the Thal desert lying between the Indus ıd the Jhelum rivers in the Punjab. The headworks will be at Kalabagh ıd will comprise a barrage 3,800 ft. long with 56 gates. The gates will be) ft. long, 15 to 18 ft. high and capable of taking a static head of about) ft. The gates will have a maximum discharge capacity of 1,200,000 ı.sec. At the time of diversion a discharge of between 20,000 and 60,000 ı.sec. is anticipated which is many times greater than the discharges which ıve had to be dealt with at previous diversions in the Punjab.

Elaborate desilting works are proposed at the canal head. Upstream of e canal regulator will be a silting flume 2,000 ft. long from which silt ill be continuously extracted through numerous small outlets distributed ver the length and breadth of the flume. The bed of the flume will be lined ıd corrugated longitudinally to guide the silt to the orifices.

The capacity of the canal will be 6,000 cu.sec. and it is proposed to line e main canal and the branches, comprising about 260 mi. of channel, with inforced brick masonry. The lining of the distributaries with a cheaper ning of the same type is under consideration

Iran.—While Persia, or Iran as it is officially called, was one of the ırliest countries of the world to use irrigation, it is only during the past w years that a revival of interest in this subject has come about. The overnment of Iran was in 1940 greatly interested in increasing the irrigated rea and in making irrigation water more effective.

In many parts of the country dam sites and irrigation canals in 1940 ere being surveyed and estimates prepared to determine costs. In the icinity of Kermanshah, on the headwaters of the Karkheh river, two proj- cts were constructed or were under construction during 1939–40. In the icinity of Khurramabad, the irrigation structures were being enlarged. In huzistan, considerable development in irrigation work was under way. Iany pumping plants were being established in the lower part of the arkheh river west of Ahwaz. The Karun river, which is the largest in ran, was being tapped in a number of places and plans were being devel- ped in the vicinity of Shustar, which was the site of ancient irrigation orks.

Along the Kur river, in the province of Fars, canals were being extended along the channels of old canals which furnished irrigation water for ancient Persepolis in the days of Darius the Great. Along the Gurgan river, east of the Caspian sea, many pumping plants were being established and one large dam on the Gurgan river below Gunbad-i-Qabuz, was designated to furnish water for the Gurgan plain, where extensive areas are suited to the growing of cotton.

Mexico.—Angostura dam on the Bavispe river, 100 mi. south of Agua Prieta, Sonora, Mexico, which was started in 1937, was completed Dec. 1, 1940. This is the first of three dams in a project being developed by the Mexican government's irrigation and reclamation commission and will provide an assurance of water for the irrigation of crops in the Yaqui valley, 200 mi. south of the dam. The dam is of the concrete arch type with a maximum height of 300 ft., 100 ft. thick at bedrock and 12½ ft. thick at the top. It will contain 225,000 cu.yd. of concrete and will create a lake 25 mi. long and 8 mi. wide at its widest point. The gross storage capacity is estimated as 1,029,500 ac.ft., of which 81,100 ac.ft. are provided for silting. It is expected that 740,800 ac. of additional land will be brought under irrigation after the completion of the Angostura dam.

The second step in the irrigation and reclamation commission's project will be the construction of the Camellon dam in the Aros river. The reservoir created by this dam will have an estimated storage capacity of 486,000 ac.ft. and will serve to irrigate 123,000 ac. of additional land.

The third step involves the construction of El Aguila dam on the Yaqui river, which will impound 1,459,000 ac. ft. of water. It is estimated that the irrigated area will be increased by about 309,000 ac.; making a total of about 741,000 irrigated acres in the entire Yaqui river zone.

Brazil.—In northeastern Brazil, extensive tracts of land in the states of Piauhy, Ceará, Rio Grande do Norte, Parahyba, Pernambuco, Alagoas, Sergipe and Bahia, are subject to general or partial droughts. In these regions, which embrace about 258,000 sq.mi., with a population of 6,000,000 inhabitants, there were in construction in 1940, by the Brazilian government, five irrigation projects, to reclaim about 750,000 ac., and including storage and regulation dams, irrigation and drainage canals and about 6,000 mi. of roads. (*See* also DAMS.)

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Islam. The year 1940 was marked by no striking movements within the Islamic world, though the remarkable revolutions on the continent of Europe certainly led to a more self-reliant attitude in Islamic countries. Turkey strengthened her position as a great factor of stability in the eastern Mediterranean. The Mecca pilgrimage (Jan. 20, 1940) attracted about 50,000 foreign pilgrims.

In Saudi Arabia there was some agricultural development in the district of Kharj in Nejd, a district which was famous of old for its great fertility and which still has abundant supplies of water. The use of motor cars continued to expand. Trade advanced. Gasoline production in Hassa was extended by the discovery of petroleum in great quantities in a well in another field at a depth of 10,000 feet. The result was a further development of the port of Ras Tanoora on the Persian gulf.

European events cast their shadow on the Islamic world. The noted Pan-Arabian leader, Emir Shekib Arslan, definitely gravitated towards the axis powers in 1939. Previously there had been a great deal of ridicule of Mussolini's claim (1937) to be the "protector of Islam." The fascist designs on Tunisia and Islamic North Africa generally had been acridly criticized, and a certain amount of sympathy had been created for France in the expectation that French policy would tend towards the liberation of Islam from autocratic outside control. The visit of the French premier, M. Daladier, to Tunisia (Jan. 1939), had been well received. The French savants, too, had done more than any other non-Islamic scholars to study and encourage the cultural and literary movements in modern Islam.

But after the fall of the popular front government in France (Nov. 1937–Dec. 1938), the feeling seems gradually to have changed, until, with her collapse, France ceased for the time being to be a factor of major importance in Islamic politics. It is possible, however, that the emergence of support for General de Gaulle's Free French Africa may bring Islamic movements again into the full current of world politics.

In India and in North Africa there were side by side an ad-

herence to old local customs and an enforcement of strict Islamic law. This has given rise to a great deal of conflict in courts of law, as the dividing line between the two was never very clearly defined. The modern tendency, especially among the educated classes, is to substitute the precisely defined provision of the Shari'at for the loosely enforced and elastic provisions of ethnic or tribal custom. The aims of the Khaksars in Northern India are stated to be religious and social reform, but they tend to take a political colouring, and the party has come into conflict with the provincial governments both in the Punjab and the United Provinces.

Fascist relations with the Muslim world have tended to deteriorate with the development of their policy in Abyssinia and Libya. Both in the matter of land and in the exercise of civic rights Italian colonists have been placed in a specially favoured position, and the Muslims have been proportionately depressed. Italy's incursion into Somaliland, a purely Muslim country, may be an additional factor in ranging Muslim opinion against Italy.

A law was passed in Greece (1940) granting a piece of ground for building a mosque in Athens. (A. Y. A.)

Isle of Man: *see* BRITISH EMPIRE.

Isotopes, Separation of: *see* BIOCHEMISTRY; MATTER, STRUCTURE OF; PHYSIOLOGY.

Italian Colonial Empire.

The table gives essential information relating to the Italian colonial empire. Total area 1,486,914 sq.mi.; total population 58,418,000.

History.—In the first half of 1940, before her entry into the war (June 10), Italy continued her policy of making her empire economically self-supporting. General Teruzzi stated in January that private capital invested in Africa amounted to some 5,000,000,000 lire; more colonists from southern Italy were settled in Libya and East Africa; it was reported in April that some 25,000 "workmen" had been landed in Albania—at the same time as fleet exercises were in progress in the Dodecanese and off the Albanian coast; and the attempts to hold down recalcitrant chieftains in Abyssinia were not relaxed. At the Brenner meeting between Hitler and Mussolini on March 18 one of the "eleven points" said to have been discussed was that Italy should have post-war privileges in Jibuti and Tunis and in the management of the Suez canal, and in the same month the fusion of the Albanian and Italian armies was completed.

"DARKEST AFRICA" had its fill of superior culture in 1940, according to Messner of the *Rochester Times-Union*

Meanwhile the defence of Libya proceeded apace, and there were many indications that Italy was about to become a belligerent. Warlike speeches were made at the celebrations of the fourth anniversary of the proclamation of the empire (May 9), while shortly before Count Grandi claimed that the fascist empire could not remain on the outskirts of the conflict and that its people "powerful in its arms, strong in its right, conscious of its mission" formed from the Alps to the Indian ocean a compact army of

Italian Colonial Empire

Country and Area square miles (approx.)	Population (000's omitted)	Capital, Status, Governors, Premiers, etc.	Principal Products 1938 (in metric tons)	Imports and Exports 1938 (in lire, 000's omitted)	Road, Rail, and Shipping 1938	Revenue and Expenditure (in lire, 000's omitted)
ITALY, 119,740	44,346	Rome, kingdom, *King:* Victor Emmanuel III. *Premier:* Benito Mussolini.	wheat 8,091,800; maize 2,936,000.	imp. 10,918,000† exp. 7,960,000†	rds. 12,930 mi. rly. 10,394 mi. shpg. cleared (monthly av.) 7,713 tons	(est. 1940–41) rev. 29,002,000 exp. 34,895,000
ALBANIA, 10,632	1,038	Tirana, annexed kingdom. *Lieut.-General:* F. Jacomoni di San Savino.	maize 155,345; wheat 44,910.	imp. 22,979‡ exp. 9,749‡	rds. about 1,200 mi.	(est. 1938–39) rev. and exp. 40,000§
AFRICA Italian provinces of Libya, 213,876	745*	Tripoli, included in the national territory of Italy, *Governor-General:* Marshal Graziani.	(1937) barley 38,000; wheat 17,500.	imp. 882,057 exp. 108,961	rds. 3,260 mi. rly. 271 mi. shpg.: passengers arrived 92,256; departed 80,614	(est. 1939–40) rev. and exp. 600,115
LIBYAN SAHARA, 465,482	48	Homs, colony, under military authority.				
ITALIAN EAST AFRICA, including Ethiopia, Eritrea and Italian Somaliland, 676,149	12,100	Addis Ababa, colony, *Viceroy:* H.R.H. the Duke of Aosta.	barley (Eritrea 1936) 19,000; coffee (Ethiopia, export 1937) 14,000	imp. (Ethiopia 1938) 2,477 exp. (Ethiopia 1938) 191	rds. 3,142 mi. rly. 709 mi. shpg. passengers arrived, 133,128 departed 156,176	Ethiopia: (est. 1939–40) rev. and exp. 2,183,000. Somaliland: (est. 1938–39) rev. and exp. 70,705.
ASIA Italian Islands of the Aegean sea, 1,035	141	Rhodes, colony, *Governor:* General Army Commander Ettore Bastico.	olive oil 617; wine 27,000 hectolitres	(1937) imp. 122,374 exp. 19,705	rds. 376 mi.	(1934–35) rev. and exp. 48,000.

*Libyan population, Italians excepted, the latter being included in Italy. †Excluding trade with colonies. ‡In gold francs. §In gold francs, est. April 1, 1939 to June 30, 1940 (=15 months).

;,000,000 soldiers." Nervousness increased in adjacent areas: the end of April British shipping was temporarily diverted om the Mediterranean to the Cape route, and before the middle May the British Mediterranean fleet had reassembled at Alexdria and Egypt was taking defence measures. On June 4 the alian law for the organization of the nation at war was extended Italian Africa, and on June 10 Mussolini declared war against he plutocratic and reactionary democracies of the west." From at moment civilian activities in the Italian colonial empire ased. (*See* also EUROPEAN WAR.)

alian East Africa: *see* ITALIAN COLONIAL EMPIRE.

alian Literature. During the past 15 years Italian writers have been encouraged to seek their inpiration in the "new era." Numberless literary prizes have been fered and granted. Withal, 1940's literary output gave further roof that creative writing is a plant which does not flourish nder a totalitarian sky. For intellectual solace the reading ublic turned to the old masters which publishers have been -editing. Critics, in conformity with this tendency, continued explore and re-evaluate the literature of the middle ages, the enaissance and especially that of the last hundred years. The utstanding books of 1940 belonged, of necessity, to this scholarly end.

The *Storia della letteratura italiana* by F. De Sanctis was rescovered and proclaimed an unsurpassed masterpiece of literary iticism. The two-volume edition by B. Croce (Laterza) was resued and Hoepli was publishing a monumental new edition. F. lora produced a scholarly yet practical *Storia della letteratura aliana* (Mondadori) in three volumes, the third in collaboration ith L. Nicastro. Noteworthy for the light they shed on recent urrents were A. Gargiulo's *Letteratura italiana del Novecento* Le Monnier) and G. de Robertis' *Scrittori del Novecento* (Le Monnier). B. Croce's *Letteratura della nuova Italia* was comleted with the publication of the sixth volume. M. Apollonio dded a second volume on the Renaissance to his *Storia del teatro aliano* (Sansoni).

The inexhaustible personality and philosophy of Leopardi inpired new studies, the most significant of which were G. Ferretti's *Vita di Giacomo Leopardi* (Zanichelli) and A. Tilgher's *La filosofia di Leopardi* (Religio). Bio-critical works on notable figures of various periods, some based on newly discovered documents, were numerous. The most prominent included N. Valeri's *La Vita di Facino Cane* (Soc. Sub. Edit.); *Metastasio* (Zanichelli) by L. D'Ambra who died in Dec. 1939; M. Saponaro's *Carducci* (Garzanti); M. Rumor's *Giacosa* (C.E.D.A.M.); A. Codignola's *Un dramma intimo di Cavour* (Garzanti); A. Monti's *Clara Maffei e Carlo Tenca* (Garzanti). The interest in epistolaries justifiably continued unabated with G. Galilei's *Frammenti e lettere* (Sansoni); Cosimo I de' Medici's *Lettere* (Vallecchi) and some thousand *Lettere scelte* of A. Fogazzaro (Mondadori).

The ever-changing map of Europe stimulated the writing of histories of various countries of Europe and the Mediterranean basin, the majority *ad usum delphini*. *Spagna di Dio* by O. Pedrazzi (Garzanti) and *Storia dell'Imperialismo inglese* (Ist. Fascista dell'Africa italiana) typify this category. On the other hand, a goodly number of scholarly works also appeared, such as those on the *Mediaeval Guilds* (Le Monnier); A. Sorbelli's *Storia della Università di Bologna*, vol. i (Zanichelli); F. Valsecchi's *L'Unificazione italiana: 1854–1859* (I.S.P.I.); L. Salvatorelli's *La Triplice Alleanza* (I.S.P.I.).

The growing awareness of the Americas found expression in N. Cuneo's *Storia della emigrazione italiana in Argentina (1810–1870)* (Garzanti); A. F. Guidi's *Relazioni culturali fra Italia e Stati Uniti d'America* (C.E.D.A.M.) and in a book of impressions by an artist, *America amara* (Sansoni) by E. Cecchi, which contains bitter words on the political life of the United States.

In the field of fiction many young writers, following government instructions, extolled fascist heroes, the joys of motherhood, agricultural life in East Africa or, as in *Mal di paese* (Garzanti) by E. Rivalta, the irresistible "call of the blood." However, they appeared not to enjoy public favour. The old guard, not inspired by the new order, pursued the dissection of their adolescence: B. Cicognani's *L'età favolosa* (Garzanti). Life in boarding school seemed a favourite topic for both old and new writers: O. Vergani, *Recita in collegio* (Garzanti); E. Mascagni, *Compagne di collegio* (Garzanti). But the novel which attracted most attention, *Catarina Marasca* (Garzanti) by G. Gulli, depicts the realities of present-day life. Its author is a 23-year-old Calabrian girl who died of starvation before her book appeared.

The activity of the Italian writers in exile was crippled by

UNERAL PROCESSION of Marshal Italo Balbo and his flight companions at ripoli, July 3, 1940. The governor-general of Libya was shot down June 28, cording to the Italian government, by a British warplane while flying over obruk

the fall of France. Nevertheless G. Ferrero succeeded in publishing *Reconstruction, Talleyrand à Vienne, 1814–15* (Plon). In the United States there appeared C. Sforza's *Fifty Years of War and Diplomacy in the Balkans* and *Neither Liberty nor Bread,* edited by F. Keene, an important work on the meaning and tragedy of fascism written by 42 Italian writers in exile. (M. F. C.)

Italian Somaliland: *see* ITALIAN COLONIAL EMPIRE.

Italy, a kingdom consisting mainly of the peninsula projecting south into the Mediterranean from the mass of central Europe; the land boundaries, which reach as far north as the parallel of 46°40′ N., being formed by France, Switzerland, Germany and Yugoslavia. Capital, Rome. Ruler: King Victor Emmanuel III (*b.* 1869, *succ.* 1900). National flag: green, white and red in vertical stripes, with the arms in the white stripe.

Area and Population.—Excluding Libya: area, 119,764 sq.mi.; pop. est. (Jan. 1, 1939), 44,394,000. Chief cities (pop. 1936): Rome (1,155,722), Milan (1,115,848), Naples (865,913), Genoa (634,646), Turin (629,115). Language, Italian; religion, Roman Catholic.

History.—Completely overshadowing all other Italian interests during 1940 was Italy's entry into the war on June 10. When the year opened it was by no means certain that Italy would become an active belligerent. In Dec. 1939, Ciano, foreign secretary, had explained that while Italy was Germany's ally there was an unpublished proviso in the "Pact of Steel" (the axis alliance) by which Italy might avoid war for three years if that time should be necessary to prepare for hostilities. Furthermore, for the time being Hitler did not need Mussolini's help, and Italy's nuisance value was worth more to Germany than any actual Italian aid.

Early in 1940, indeed, Italy seemed almost more anti-Russian than anti-French and anti-British, since it was alarmed at the Russo-German pact of 1939 which went further than it had expected, and Italian sympathy for the Finns in their death-struggle with the soviets was widespread. Crowds in Rome demonstrated for Finland and Italian aeroplanes were dispatched to aid the Finns. A Russia, victorious in the north, might turn an ambitious eye to the south, and Italy was desperately anxious to ward off any Russian invasion of the Balkan peninsula, a region in which it hoped to expand.

By the middle of February, however, a shift could be noted in Italian foreign policy, due mainly to quarrels with Britain. The latter country had sought to conciliate Mussolini by trading raw materials for machinery, and during the first five months of the war Italian industry had flourished by trading no less than $250,000,000 worth of machinery with the Allies. But there was another side to the picture. The British blockade at both ends of the Mediterranean interfered extensively with Italian trade, particularly in those products which might be re-exported to Germany. An Anglo-Italian trade conference came to an untimely end and the Italian press attacked Britain bitterly.

The winter of 1939–40 was unusually severe and there was a food shortage in Italy. On Jan. 15 sugar and coffee were rationed, the former at 17½ oz. per person, per month (one-third less than in Britain), and the latter at 3 oz. More important was the scarcity of coal. Hitherto it had reached Italy either overland or by sea from Britain, Germany and Poland. The overland route was expensive and furthermore the Danube over which most of it came was tightly frozen. The sea route lay at the mercy of the royal navy. The British were willing to supply Italy with coal but they refused to let Italian ships convoy German coal from Rotterdam. When the British seized Italian colliers in March, Mussolini became so angry that Britain thought it advisable to release the colliers.

But now the Duce's blood was up. "The Sphinx of the Tiber" had little to say for publication, but on March 18 it was noted that he conferred with Hitler at the Brenner, and as the Germans struck at Scandinavia (*see* NORWAY; DENMARK), the Italian press launched into a concerted attack upon Britain, "saluting," as it did so, "German soldiers who have fallen on Norwegian soil" (the Italians had abundant sympathy for Finns but none for Norwegians or Danes) and announcing that "the bugle is about to sound." Concomitant with German victories in the Netherlands and Belgium in May were louder and more defiant blasts of defiance from Italy. On May 9, the fourth anniversary of the new Italian empire, the Duce bluntly told his people: "After my speeches you must accustom yourself to my silence. Only the facts will break it." And on May 22, the first anniversary of the alliance with Germany, Ciano said, "Italy cannot remain neutral from the present terrible struggle."

Meanwhile the Italian people were whipped into frenzy by poster propaganda which laid all responsibility for the increase in cost of living on the British blockade. The *Osservatore Romano,* the Vatican newspaper, was boycotted because it published the war news from all quarters. Pro-axis news alone was permitted to circulate. Preparations for the universal exposition at Rome which was to represent in 1942 the 20th year of triumphant fascism were abandoned and feverish war mobilization took place.

On June 10 the Duce took the plunge. He declared war on Britain and France for three ostensible reasons: France and Britain were "pluto-democracies," rank with decadent capitalism and so the natural enemies of the new order in Europe; they had joined together to hold Italy imprisoned in the Mediterranean sea and it was determined to break its bonds; and finally, his fascist word of honour demanded that he stand by his ally, Germany. A fourth reason was not stipulated. Since the war seemed well-nigh over, France beaten to its knees and Britain left to fight alone, if Mussolini wanted to be in at the kill it was necessary that he hasten.

Italy's war with France lasted 16 days during which reports differ as to just what Italian arms accomplished. According to Mussolini his troops broke through the entire line of the French fortifications on the Italian border, penetrating France in distances from 5 to 20 miles. Two French destroyers were also said to have been sunk by the Italian navy. On June 24 came the armistice. The Italians were to retain for the duration of the war such gains as they had made in France proper; in the colonies, the French were to demilitarize a considerable zone in Tunisia west of Libya; French Somaliland was to be demobilized.

During the second half of 1940 Italian arms scored some slight success only to meet in December with extraordinary and unexpected defeat. The strategy of the war called for an attack by Italy on the Suez canal, an important lifeline of British commerce and an essential conquest if Italy was to break out of its "prison house." The Suez was far away, even from Italy. It might be attacked from the water, but when France collapsed and the French navy was interned or destroyed by the British the latter added several battleships to its already formidable Mediterranean squadron thus making it superior to the Italian fleet.

The latter soon proved incapable of inflicting any extensive damage on the royal navy. Theoretically comprising a huge number of destroyers, submarines and swift motor torpedo craft, it was designed for a "hit and run" warfare. But in this war there was more run than hit. The Italian ships kept pretty much in home waters, fleeing when attacked and scoring only a few very minor victories. On the other hand the British ships could not get at their elusive foe; they did manage to sink a cruiser and some light craft, but the main fleets of the two powers never came to grips in all the year.

ALIAN STUDENTS demonstrating for entry into the war shortly before Mus-
ini's decision of June 10, 1940

To approach the Suez by land was difficult. To the north and st lay the Sinai desert; beyond that Palestine (garrisoned British troops); beyond Palestine, Syria (still garrisoned the French); and still farther lay Turkey, a neutral state, iendly to Britain. Italy could not very well hit at the canal om this direction.

To the south of the canal was Egypt and the Anglo-Egyptian idan. The latter abutted on the new Italian colony of Ethiopia, id since the Italian garrison there was large, a foray toward the ile was quite possible, and one was made scoring a minor Italian ctory in the northern Sudan where some villages were taken. ikewise from Ethiopia Italian troops pressed directly south to e British colony of Kenya, the outlying districts of which ey successfully invaded.

The Italians had even better luck with British Somaliland, a orthless desert region from the economic point of view, but of me slight value strategically since it lay opposite Aden, the ritish fortified port in Arabia which commanded the southern proaches to the Red sea. The Italians threw some 20,000 to ,000 men against British Somaliland in August and conquered completely, the outnumbered British garrison escaping by sea.

The Suez also could be approached by land from the west and nce the Italians had in Libya at least 250,000 men the danger oint was here. Before the defeat of France it was believed that rench troops in Tunisia readily could prevent any movement of iese Libyan forces against Egypt. But now France was out of the ar and the handful of British troops in Egypt were in real dan- er of being caught between the 250,000 Italians in Libya and ie 100,000 Italians who garrisoned Ethiopia. Fortunately for ngland it was summer, an almost impossible season for an Egyp- an campaign. If the British could only stave off the Italian ad- ance long enough it was believed that sufficient reinforcements ould flow in from Australia and New Zealand to stem the tide.

And that is about what happened. The Italians could not rein- orce their Ethiopian army, but they could and did strengthen iat of General Graziani in Libya, who began in late summer a iuch-advertised offence against Egypt along the Libyan littoral. y the middle of September he had penetrated 80 miles within the gyptian border to Sidi Barrani and then went no farther. The eat was terrible, the single road upon which he could advance pen to attack from the desert and the sea, and all of his water had to be carried by pipe line from his base. Perhaps these were the reasons which led to the sudden "bogging down" of the expedition. It could hardly have been the military opposition of the British; they had been able to do little but harass his advance by air attack. Or there might have been other reasons; the failure of the Italians in Ethiopia to make a counterthrust at the expected moment might have been one, the Balkan situation another.

Mussolini was worried about the Balkans. The Russians already had compelled Rumania to disgorge Bessarabia; Hitler apparently was supplanting him, the Duce, in the good graces of the Magyars, and Hitler rather than Mussolini had won for Hungary most of Transylvania. There were strong German detachments in Rumania, ostensibly to guard oil wells. The plain facts were that both Germany and Russia were gaining in Italy's back yard, and Italy by inference was losing face in the Balkans.

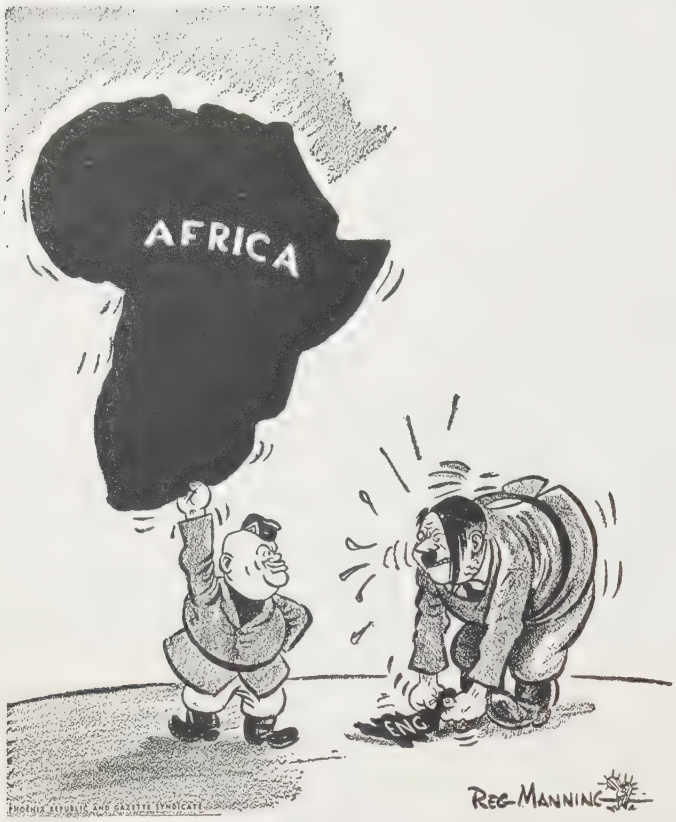
The Duce was determined that this should not be. Complaining officially about Grecian bandits in Italian Albania, the Duce delivered an ultimatum to Greece on Oct. 28, 19th anniversary of the fascist march on Rome, demanding that Greece surrender certain bases to Italy. War followed. Italy invaded Greece from Albania and almost immediately met with disastrous defeat.

The weather was bad, the terrain difficult and the Greeks better armed than the Italians had expected. But despite these factors it is difficult to explain the collapse of the Italian morale in Greece and in Albania except on the ground that the Italians had no stomach for fighting.

The Greeks were not only able to drive the invader out of their country, they invaded Albania in return; captured valuable war booty, guns, munitions, trucks; threw the retreating Italians into utmost confusion; forced their own way through southern Albania until by the end of the year the Greeks were within 30 miles of the Italian base at Valona.

As these things happened the royal navy crippled a number of Italian battleships with torpedo planes, and the British army, heavily reinforced from Australia, surprised the Italians in Egypt, captured Sidi Barrani, compelled the surrender of 40,000 Italians, drove back Graziani's army and on Dec. 31 were besieging it in Bardia, in Italian territory.

Education.—Public elementary schools, 131,580; pupils, 5,411,-596. Students in secondary schools, 647,505; in universities, 77,-429. A special school charter of 1939 required all education in Italy to have a fascist stamp.



"HOW Y' DOIN', ADOLF?" Comparative estimate of the Axis' military accomplishments before the British got under way in Africa during Dec. 1940, by Manning in the *Phoenix Arizona Republic*

Defence.—Army, 900,000; planes, 5,500; battleships, 6; cruisers, 22; destroyers, 61; torpedo boats, 71; submarines, 105 (figures for 1939).

Finance.—Estimates for year ending June 30, 1940: revenue, 24,560,000,000 lire; expenditure, 29,316,000,000 lire. Lira quoted Dec. 1939 at 5 cents.

Trade and Communication.—Imports, 11,061,000,000 lire; exports, 8,007,000,000 lire. Railway, 29,220 km. Shipping: 2,301 sailing vessels, 1,057 steamships, 293 motorships. Total over 2,000,000 metric tons.

Agriculture, Manufacture and Minerals.—Livestock in 1938: horses, 791,120; asses, 791,390; mules, 431,150; cattle, 7,666,890; pigs, 2,940,440; sheep, 9,467,400; goats, 1,828,070. In thousand quintals: wheat, 12,420,000; maize, 3,724,000; beans, 1,625,000; olives, 2,038,000.

Most important industry, the textile. In 1938 it had 938 factories. In minerals, sulphur continued to lead, there being mined, in 1938, 2,363,000 metric tons of sulphur, to 930,000 tons of iron pyrites, next competing mineral. (*See* also ALBANIA; ANTI-SEMITISM; ARMIES OF THE WORLD; BALKAN ENTENTE; BRAZIL; EUROPEAN WAR; GERMANY; GREAT BRITAIN AND NORTHERN IRELAND; RELIGION; UNITED STATES; YOUTH MOVEMENTS.)

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Ivory Coast: *see* FRENCH COLONIAL EMPIRE.

Jabotinsky, Vladimir (1880–1940), Russian Zionist, was born in Odessa and early became interested in the Zionist movement. He headed a Jewish legion in Palestine during the war of 1914–18 and sought to set up an independent Jewish state. In 1920 he went to England and became an officer of the World Zionist organization, but he broke with Chaim Weizmann. He went to the United States in 1926 and again in 1935 and in March 1940. He died at Hunter, N.Y., Aug. 3.

Jamaica: *see* WEST INDIES, BRITISH.

James Tait Black Memorial Prizes: *see* LITERARY PRIZES, *Great Britain.*

Japan, an empire, capital, Tokyo; ruler, Emperor Hirohito; premier, Prince Fumimaro Konoye. A chain of islands in the western Pacific, stretching from South Sakhalin (50° of latitude) to the South Seas mandated islands (which lie near the equator); includes Chosen peninsula, on the mainland of Asia, and the small Kwantung leased territory, with the city of Dairen on the Liaotung peninsula. Japan proper consists of the four larger islands of Honshu, Hokkaido, Shikoku and Kyushu (with many adjacent smaller islands). Chosen, Formosa and South Sakhalin are administered as colonies, along with the South Sea islands, former German possessions, which were granted to Japan under a mandate from the League of Nations after the World War (1914–18). The total area of the Japanese empire in 1940 was 263,359 sq.mi., of which Japan proper represented 148,756 sq.mi. Population of the empire (census Oct. 1, 1935) 97,697,555. This figure had increased to 103,087,100, according to an estimate of the Cabinet Statistics bureau of Dec. 1, 1937.

History.—*Japan in China.*—The course of the war in 1940 would seem to indicate that the Japanese had reached the physical limits of possible conquest and occupation. Their troops (it is estimated in some quarters that in 1940 the Japanese had 1,000,000 men in China and Manchoukuo) were spread out thinly over long lines of communication and further advances, as a rule, would bring the Japanese army into mountainous, difficult country, without railways or good roads. About the only significant military forward movement during the year was the capture of Shasi and Ichang, on the Yangtze river, about 300 mi. above Hankow. On the other hand, the Japanese toward the end of October evacuated Nanning and the part of western Kwangsi province which they had previously occupied, on the ground that their movement into Indo-China made the holding of this part of Kwangsi superfluous. On July 6 the Japanese army stated that Japanese losses in killed were 85,800, while 1,587,600 Chinese had been killed and 617,264 sq.mi. of Chinese territory had been occupied. These casualty estimates are vigorously contested by Chinese sources. The shrinkage of the area planted with cotton in North China was an indication of the failure of the Japanese to establish effective control of the agricultural hinterland in this region, since Japan looked forward to developing a source of cotton under its control in this part of China.

On March 30 Wang Ching-wei, veteran member of the Kuomintang who had left Chungking toward the end of 1938 and had come to an agreement with Japan, set up a self-styled, new government of China in Nanking and on Nov. 30 Japan recognized this regime. This had no visible effect on the course of hostilities; a train between Shanghai and Nanking being dynamited by Chinese guerrillas on the eve of the formal Japanese recognition of Wang Ching-wei's government.

Japan and the European War.—Japan's attitude toward the war in Europe remained one of nonparticipation; but there was a distinct swing in official sympathy toward the axis powers after the German victories in the Low Countries and in France in May and June. In the first months of the war Japan's attitude had been cautious and reserved, partly because the Soviet-German pact of Aug. 24, 1939, was a distinct shock to Japanese diplomacy.

But on Sept. 27, 1940 Japan, Germany and Italy signed a triple alliance in Berlin. Its main points were that Germany and Italy would respect Japan's position of leadership in the "new order" in East Asia, that Japan would maintain a similar attitude in regard to the position of Germany and Italy in Europe, that should any of the allied powers be attacked by a third power not in

ved in the war the other two should render all possible polit-l, economic and military assistance; that the pact would not alter status quo as between the allied powers and the soviet union. This treaty received several official comments and elaborations. emier Konoye declared on Oct. 4 that if the U.S. would recog-e Japan's leadership in east Asia Japan would recognize the ited States' leadership in its continent. On the other hand, if the S. should challenge the new alliance, war would be the result. reign Minister Yosuke Matsuoka, in an interview granted to U.S. vspapermen on Dec. 9, 1940, stated that the tripartite pact dom-tes Japan's foreign policy, but that Japan would only feel iged to fight if it were convinced that the U.S. was the aggressor, the event of a conflict between the United States and Germany.

Japan and the United States.—The year 1940 was a year of reasing tension between Japan and the United States. No gress was realized in harmonizing the opposed views of the o countries, which ranged over a wide variety of subjects, m the larger implications of Japan's so-called "New Order East Asia" to specific U.S. grievances about trade discrimina-ns suffered by U.S. citizens in regions under Japanese military upation.

The U.S.-Japanese commercial treaty, which had been de-unced by the United States government, with six months' notice, July 1939, expired on Jan. 25, 1940 without any renewal. uring the year the U.S. took advantage of its new freedom of tion to impose restrictions on exports to Japan on three occa-ns. The exportation of gasoline of high octane content, suit-le for aviation, was forbidden in July. Scrap iron was barred September and a licensing system with restrictive implications s introduced for ferro-alloys and for iron and steel manufac-es in December. While these measures were officially attributed the needs of the United States' own defence they were widely erpreted both in the U.S. and in Japan as being designed to nit Japan's acquisition of strategic raw materials from America.

The United States state department several times challenged tual or possible Japanese moves of expansion on the Asiatic ntinent. When the Wang Ching-wei regime was inaugurated Nanking on March 30 Secretary of State Cordell Hull char-terized this as "a further step in the program of one country impose by armed force its will upon a neighbour, blocking a ge area from normal political and economic relations with the st of the world." On April 17 Mr. Hull, at a time when rumours Japanese action against the Netherlands Indies had gained culation, announced that the United States stood unequivocally ainst "any intervention in the domestic affairs of the Nether-nds East Indies or any alteration of their status quo by other an peaceful means."

No overt action by Japan against the Netherlands Indies took ace; but a similar warning from Mr. Hull about the disapproval U.S. public opinion of any forceful change in the existing order French Indo-China was disregarded when the Japanese moved to the northern part of this French colony in the latter part of ptember. Japanese recognition of Wang Ching-wei's regime incided with the announcement by the U.S. government of a w credit of $100,000,000 for the Chinese Nationalist govern-ent at Chungking. Half of this sum was guaranteed by Chinese ports of tungsten, wood-oil and other commodities; the other lf was designed to strengthen the Chinese currency.

Early in October the state department advised Americans ose presence was not urgently required to quit the orient and considerable number of women and children and a smaller mber of men returned to the U.S. from Japan, China and the ilippines. The long-established, American-owned *Japan Adver-er*, a Tokyo daily newspaper, was sold to Japanese ownership. The Japanese government appointed Admiral Kichisaburo Nomura, a veteran naval officer of moderate views, ambassador to the United States in November. While Admiral Nomura's sentiments were known to be favourable to rapprochement between the two countries the Japanese press expressed scepticism as to what he would be able to accomplish, in view of the unfavourable atmosphere which he would encounter.

Japan and Other Powers.—Japan's relations with Great Britain, strained since the beginning of the war in China, remained cool and sometimes troubled, although Great Britain, because of its life-and-death struggle in Europe, displayed a tendency to leave the initiative in far eastern matters to the United States. British troops were withdrawn from Tientsin and Shanghai, thereby reducing the possibilities of friction with the Japanese forces of occupation. A dispute arose when a British warship stopped the Japanese liner "Asama Maru" in January and took off 21 Germans; a compromise settlement was reached when nine of the Germans were handed back as over military age.

Great Britain made one important concession to Japan when it consented to close the Burma road, one of China's few remaining links with the outside world, for three months, beginning on July 17. Soon afterwards, however, the Japanese police arrested a number of Britons in Japan, accusing them of espionage. One of those arrested, the correspondent of Reuter's news agency, James M. Cox, committed suicide, according to the Japanese version, while in the custody of the police.

The conclusion of the pact with Germany and Italy apparently convinced the British government that there was little hope of conciliating Japan; and the Burma road was reopened to traffic on Oct. 17.

Japan's relations with the soviet union were rather ambiguous; but there was a noteworthy absence of such sharp border fight-

"LITTLE MAN HAVING TOUGH TIME." Costello's conception in the *Knickerbocker News* (Albany, N.Y.) of Japanese success during 1940 in attempting to end the "China incident"

A TOAST IN NAZI FASHION to the Japanese-German-Italian pact signed Sept. 27, 1940, was drunk in Tokyo by (left to right) Italian Ambassador Indelli, Japanese Foreign Minister Matsuoka, German Ambassador Ott and Heinrich Stahmer, a special nazi envoy

ing as took place at Changkufeng in 1938 and at Nomonhan in 1939. A new Japanese ambassador to Moscow, General Tatekawa, took up his post in the autumn with instructions to work for the conclusion of a non-aggression pact with the soviet union; but there had been no visible developments in this field up to the end of the year.

Japan took advantage of France's collapse in Europe to press demands for the cession of air bases in Indo-China. The entrance of the Japanese troops into this French colony late in September was accompanied by some fighting, apparently because one Japanese general was not informed of or was indifferent to an agreement which had been concluded between other Japanese military authorities and the French officials. There was also some desultory fighting in the autumn along the frontier between Thailand (Siam) and Indo-China. Thailand demanded the retrocession of territory which had formerly been taken over by Indo-China. It is not clear on the basis of available information whether and how far the Japanese extended their military penetration of Indo-China to the southern part of the very large colony.

Japanese Internal Developments.—Internal political life in Japan went on without important changes during the cabinet of Admiral Mitsumasa Yonai, who succeeded General Nobuyuki Abe in January. But after Prince Fumimaro Konoye, who had been premier at the beginning of the war in China, resumed this office on July 23, 1940, there were interesting and striking developments in the direction of a more totalitarian type of state. These developments were probably motivated partly by the increasing stringency of the economic situation, partly by a tendency to imitate the political form of the states which seemed to be victorious in Europe.

All the Japanese political parties went through a process of self-dissolution. A so-called "Imperial Rule Assistance Association," with a hierarchical organization dictated from above rather than from below, but with branches in the smallest villages, was set up. Just how its functions will dovetail into those of the diet is not clear; but the whole governmental trend is toward greater authoritarianism. Bodies with international affiliations such as Rotary clubs and Christian churches found it expedient to dissolve or to reorganize themselves, as the churches have done, on a basis of excluding foreign executives and foreign financial aid.

The pinch of war began to be felt more acutely in daily life in 1940. Matches and sugar were rationed; the sale of rice was controlled and the authorities urged the people to economize in its use; many foodstuffs were hard to obtain; wool and cotton clothing disappeared from the market, being replaced by very inferior staple fibre products. There was a water shortage in Tokyo and in some other large cities as a result of drought and the increased demand which is associated with a larger populatio

Education and Religion.—There were 48,215 schools of a kinds in Japan in 1937, with 15,242,333 students and pupil Elementary education is compulsory and the percentage children attending the schools was 99·59. There were 45 unive sities in Japan in 1937, with 72,195 students. The Japanese co stitution provides for freedom of religion. Certain acts of reve ence before Shinto shrines are regarded as demonstrations loyalty to the state, not as enforced profession of the Shinto re gion. The latest statistics (end of 1933) show that there we 41,127,307 Buddhists, 16,525,840 Shintoists and 439,444 Chri tians in the country.

Army and Navy.—The Japanese army is raised on the basis universal liability to service of all male Japanese between th ages of 17 and 40. Its official peacetime strength is a little und 250,000, organized in 17 divisions and 34 brigades. All informa tion about the strength of the army has been withheld since th beginning of the war in China. It has been sometimes estimate that Japan has in the neighbourhood of 1,000,000 men under arm on the mainland of Asia. The distribution of these forces a between Manchoukuo, north, central and south China shifts an varies with the needs of the situation. There have been report of substantial military concentrations in Formosa and in occu pied Hainan island, off the southwestern coast of China. Th navy has also been entirely secretive as to its strength an building plans since the denunciation of the Washington treaty c naval limitation. Before the policy of secrecy went into effec the Japanese navy, as of Sept. 30, 1936, was officially reporte to possess 302 warships, of 1,134,823 tons, including 9 battle ships, 12 first class and 25 second class cruisers, 6 aircraft car riers and 3 seaplane carriers. Under the last published fleet re placement law the Japanese naval building program between 193 and 1943 called for the construction of 4 battleships, 2 aircraf carriers and a considerable number of cruisers, destroyers, sub marines and other vessels.

Banking and Finance.—The unit of currency is the yen (wort 23·48 cents in United States currency in Dec. 1940). This i the official rate, maintained by law and by penalties imposed o the private conversion of foreign currency into yen. The valu of the yen in private exchange in the free market of Shangha is much lower. The Japanese budget of 1940–41 (the fiscal yea ends on March 31) reached the record figure of 9,957,000,000 yer Most of this sum will be covered by new government bond issues which are authorized for a figure of 5,580,000,000 yen. Japan' internal loans at the end of June 1940 amounted to 23,046,076,00 yen. The total note issue of the Bank of Japan was 1,865,703,38 yen at the end of 1936; this figure had increased to 3,380,290,00 yen in June 1940. Japan's external debt, on which service ha been consistently maintained, is a little less than 1,300,000,00 yen, but the debt burden is somewhat heavier than this figur would indicate, because the foreign debt is mostly in terms o pounds and dollars, and these currencies have been devalued les than the yen.

The Bank of Japan is the central bank of issue. The Yokoham Specie bank is in charge of foreign exchange transactions an finances foreign trade. Commercial banking is largely in the hand of seven large banks: the Mitsui, Mitsubishi, Dai-ichi, Sumitom Yasuda, Daihyaku, and Sanwa. Among the foreign banks whic operated in Japan in 1940 were the National City bank of Ne York, the Hongkong and Shanghai Banking corporation, th Chartered Bank of India, Australia and China, the Banqu Franco-Japonaise and the Nederlandsch-Indische Handelsbank.

Trade and Communication.—Exports for the Japanese em pire in 1939 were 3,932,926,000 yen (an increase of 1,036,156,00 yen over 1938) and imports were 3,127,460,000 yen (an increas

291,232,000 yen over 1938). The excess of exports was 805,-5,000 yen. It must be noted, however, that almost half of pan's exports in 1939 (1,747,103,000 yen was the exact figure) nt to yen-bloc countries, to Manchoukuo, the Kwantung leased ritory and occupied China. The imports from these countries ounted to the very much smaller figure of 682,973,000 yen. pan's trade with countries outside the yen bloc was therefore avourable by 258,664,000 yen. This result, however, was more ourable than that of 1938, when the unfavourable balance of de with countries outside the yen bloc was over 550,000,000 n. Japan's unfavourable balance of trade in 1939 could proba- have been largely covered by the annual output of gold within empire. During the first seven months of 1940 Japan's exports re 1,675,453 000 yen, as against imports of 1,588,862,000 yen. There were 15,254 mi. of government and private railways in pan proper in 1937, besides 3,129 mi. in Chosen, 935 mi. in Forsa, and 300 mi. in South Sakhalin. The total number of regised ships in the Japanese empire on Sept. 30, 1938, was 4,842, h a gross tonnage of 5,339,632. The number of sailing ships s 17,791, the tonnage 1,046,476. Japan had 235 commercial oplanes on Oct. 1, 1935. Since that time secrecy has been served about the number of aeroplanes, commercial as well as itary. There has, however, been a visible expansion of the panese network of air communications in recent years. New air es have been established between the larger cities of occupied ina, such as Peiping, Tientsin, Shanghai, Nanking and Tsingtao. other line connects Japan with Bangkok, capital of Thailand am). Both Japan proper and Manchoukuo are served by numus air routes and air lines are in operation between Japan and rmosa and between Japan and Palau, chief administrative cen- of the mandated South Sea islands. The Japan Airways comny has a monopoly of commercial aviation. It was established 1939 with a capitalization of 100,000,000 yen. The length of routes in 1938–39 was 15,335 km. The number of flights was 144, the aggregate length of flights 6,209,873 km., the number passengers carried 69,268, the quantity of goods conveyed 7,807 kg., the amount of mail 819,261 kg. These figures show very substantial expansion of Japanese civil aviation during last few years. There were 11,784 telegraph offices and 12,484 st offices in Japan proper on Sept. 30, 1938. On March 31, 1938 re were 425,752 km. of telegraph lines in Japan proper, and number of telegrams handled in 1937–38 was 72,629,960. ere were 5,804 telephone exchanges in Japan proper on Sept. 1938, and the number of subscribers was 981,920.

Agriculture, Manufactures, Mineral Production.—There re 5,574,879 farm households in Japan in 1937. Over the last v years this figure has shown a slight but constant tendency to crease, partly perhaps because of the drawing of farmers into nitions industries. Japan's most important crop is rice, with e breeding of silkworms as a secondary source of income. The e crop for 1940 was estimated in November at 60,470,000 koku koku being equivalent to 4.96 bu.). This represents a subntial decline from the 1939 crop, which was 68,964,468 koku d was a result of lack of sufficient rainfall and the prevalence insect pests in some regions of the country.

Industry, when full industrial statistics were available, gave ployment to about 6,000,000 people in Japan. About half of ese were employed in tiny cottage workshops employing less an five persons. These hand industries, where wages are very w, are an important factor in Japanese economy. The prolonged r with China has affected Japan's industrial set-up, bringing ore labourers into munitions and shipbuilding plants and caus- depression in some industries which are unable to obtain norl supplies of raw material. The textile industry is Japan's gest; in 1937 it employed 1,094,583 workers, of whom a large number were girls from the country districts. Japan in 1937 was the world's leading exporter of cotton cloth, exports amounting to 2,644,028,000 sq.yd., with a value of 573,065,000 yen. There was a decline in 1938, the figures being respectively 2,180,810,-000 sq.yd. and 404,240,000 yen; and it is at about this level that the textile export industry has been maintained since that time. Before the beginning of the war Japan was the world's leading producer of rayon and ranked fourth among the producers of chemicals.

The general effect of the war has been to stimulate heavy industry and to restrict production of consumers' goods industries which are regarded as comparatively unessential and are denied adequate supplies of imported raw material under the present system of strict control of imports and foreign exchange. While many statistics are withheld on the ground of war secrecy the *Oriental Economist,* leading Japanese economic publication, continued to publish a seasonally adjusted index of industrial production, which gives the following picture of industrial output (monthly average, 1931–33=100):

General index		Consumers' goods	Producers' goods
1936	148.8	125.3	171.5
1937	167.3	136.5	197.9
1938	173.0	125.1	220.4
1939	180.8	121.4	239.7
1939 (June)	179.9	119.3	240.0
1940 (June)	173.4	102.8	244.3

This would convey the impression that Japan's industrial capacity is almost extended to the limit at the present time. Japan's chief mineral products are coal (41,803,000 tons, produced, with a value of 305,537,000 yen), gold (22,235 kg., with a value of 74,828,000 yen), copper (77,973,000 kg., value 66,617,000 yen). These figures are all of 1936, since which time statistics of mineral production have not been published. There is little doubt that there has been some increase of output under the stress of war exigencies. For additional statistics of production *see* ALUMINIUM; COAL INDUSTRY; CHROMITE; COPPER; FISHERIES; GOLD; IRON AND STEEL; MAGNESIUM; RAYON; RICE; SILVER; TOBACCO. (*See* also ARMIES OF THE WORLD; COMMUNISM; CHINESE-JAPANESE WAR; FASCISM; UNITED STATES.)

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Japanese Beetle: *see* ENTOMOLOGY.

Japanese-Chinese War: *see* CHINESE-JAPANESE WAR.

Jarvis Island: *see* SOUTH SEA AND EQUATORIAL ISLANDS.

Java, fourth in size but first in population and resources among the islands of the Dutch East Indies archipelago, is the most densely populated land in the world, with 821 inhabitants to the square mile. It is separated from Sumatra to the west by Sunda strait and from Bali to the east by Bali strait. Java and the adjacent small island of Madura (the two are treated as an administrative unit) had more than two-thirds of the population of the Dutch East Indies in 1930, with 41,719,524 inhabitants, mostly Malays who profess the Mohammedan faith. The world economic crisis of 1929–33, when the quantity of Dutch East Indian exports declined by 17% and the value by 67%, together with world-wide protectionist tendencies in relation to sugar, Java's most valuable crop, caused some important readjustments in the economy of the island. The government endeavoured to promote emigration to the neighbouring island of Sumatra, which is not so thickly populated. There was also an attempt to create an industrial base in Java. Among the industrial plants which were in 1940 under construction in the area

between Surabaya and Rambang were glass, chemical and spinning enterprises, weaving mills, hydroelectric stations, a scrap iron smelting plant, a blast furnace and rolling mill and a margarine and edible fats factory. An element of political tension was introduced into the life of the island by the German occupation of the Netherlands and the Japanese southward expansion into Indo-China. Java is a key point in the defence system of the archipelago and its military forces were estimated to have been doubled while an important naval and air base grew up at Surabaya and underground shelters were created all over the island for the eventuality of air raids. Submarines and torpedo boats and flying boats played a leading part in the island's preparations for defence. (W. H. Ch.)

Javelin Throw: *see* Track and Field Sports.
Jehovah's Witnesses: *see* Education: *Court Decisions.*

Jewish Religious Life.

Judaism in 1940 was dominated by Hitler's intention of creating a Europe without Jews. In Germany, where one-quarter of all Jewish deaths are suicides, 463 synagogues have been destroyed. In France the 250,000 Jews, largely refugees, were so broken that in all Paris there was in 1940 only one small chapel open for services. The German occupation of Luxembourg (3,000), Belgium (60,000), Holland (160,000), Denmark (6,000) and Norway (1,500), boded doom for Jewish life. In Bohemia-Moravia-Slovakia (350,000), Jewish books were burned and in Prague, characteristically, the historic statue of Moses was melted down. Judaism in the new pawns of the nazis, Hungary (450,000) and Rumania (900,000), faced sheer catastrophe. Only Portugal (1,200), Great Britain (300,000), Sweden (7,200), Switzerland (18,000), Yugoslavia (70,000), Bulgaria (50,000), Greece (100,000) and Turkey (80,000) continued to show a liberal attitude towards Jews and Judaism.

The one and a half million Jews in German occupied Poland were in 1940 passing through "probably the greatest tragedy in the entire history of Israel." Nazi policy called for their extermination by expulsion, walling them into ghettos, starvation, massacre and atrocities of which the world has heard very little. Hundreds of synagogues have been burned, sometimes the Jews themselves being compelled to fire their own synagogues and then being fined for damaging property.

Left wing Russia continued its anti-God campaign with disastrous results for Judaism among the Jews of Russian Poland (1,500,000), Bessarabia (250,000), Bukovina (50,000), Latvia (93,000), Estonia (4,500) and Lithuania (170,000), which have fallen into its power. The loss for religion was sharpest in Lithuania which became the centre of refuge for Jewish religious piety and scholarship exiled from Poland.

In Spain (4,000), Jewish marriage or burial has been forbidden, circumcision outlawed and Jewish children can be registered at birth only through baptism and can receive an education only through Catholic schools. The solitary synagogue in Barcelona has been closed, the Jewish cemetery demolished and a Jew who died was ordered buried in the dogs' graveyard.

In this world scene of Stygian darkness the only bright spots for Judaism were in the democracies. In Great Britain Judaism remained free through all war's handicaps and physical losses of synagogues and community buildings blasted through bombings from the air. Throughout the British empire and in the United States a growth of interest in the synagogue was noticeable, while Jews and Christians drew closer together by a recognition that their sacred traditions were alike facing a threat of destruction from a common enemy. The necessity of peace, liberty and democracy if religion is to survive became the main theme of every rabbinical and synagogal convention and of every synagog pulpit. In a word, how far Judaism, and therefore eventua Christianity, will survive at the moment seemed in 1940 to pend on how far the free democracies will succeed in repell the totalitarian attack. (*See* also Anti-Semitism.)

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Jewish Welfare Board.

The Jewish Welfare board is national organization which w founded on April 9, 1917, two days after the United States tered the World War, to serve the religious and welfare needs men of the Jewish faith in the military forces of the Unit States. This work has been continued in peace time and has be expanded to provide service to disabled veterans, members of Citizens Military Training camps and of the Civilian Conservati corps. This work is being expanded in view of the increase military and naval forces in the current emergency.

The Jewish Welfare board is also the national parent organi tion of Young Men's Hebrew associations, Young Women's He brew associations and Jewish community centres, of which the are 325 in the United States and Canada, with a membership approximately 400,000 men, women, young people, boys and gi These organizations own 238 buildings which are used as comm nity centres. The local centres conduct a varied program recreational, cultural, civic and social activities.

The board has a department of vocational guidance for you people and has also made provision for the social and cultu adjustment of refugees through local centres. The board fost regional federations of centres which promote inter-centre re tions and activities and co-operate actively with the national ganization. Regional organizations operate in New England, N York state, New York metropolitan area, New Jersey, Penns vania and Middle Atlantic states, in the Mid-West, and on t Pacific coast. The board co-operates with the National Assoc tion of Jewish Center Workers, composed of professional work in the Jewish centre field, whose annual meeting was held in Pit burgh, Pa., May 21–26, 1940. The annual meeting of the Jew Welfare board was held in New York city Saturday evenin April 13, and Sunday, April 14, 1940. Frank L. Weil is preside of the Jewish Welfare board, and Louis Kraft is executive dir tor. The offices of the Jewish Welfare board are located at Fifth avenue, New York city. (F. L. W.)

Jews, Distribution of.

In view of the fact that in seve of the countries where the larg numbers of Jews were living in 1940 the census does not cont any questions regarding religion, that in other countries, es cially in Asia, no exact census exists, the exact number of Je in the world in 1940 cannot be ascertained. The definition persons falling under the classification of "Jewish race" is in way agreed upon. Several fascist countries in Europe which ha introduced discriminatory legislation against the "Jewish ra have defined that term in different ways. In countries where t census includes questions of religious allegiance, even this re gious criterion of Jewish faith is difficult to define exactly. T the estimates which generally vary around the figure of 16,00 000 for the Jews cannot claim any foundation on exact figures

To this uncertainty about the number of Jews in the world added in recent years a growing uncertainty about their nume cal distribution in the different countries and continents. Eve since 1933 have led partly to a decrease in the number of Jews a result of a conscious policy aimed at their extermination, par to a great shift in their distribution all over the world as result of large enforced migratory movements. The natio

alist legislation in Germany was introduced to a varying de- by conquest into Austria, Czechoslovakia, Poland, Norway, Netherlands, Belgium and France, and was imitated in fascist ntries like Italy, Hungary and Rumania.

efore the outbreak of the war, Poland was the country in ope with the largest Jewish population, estimated at about 5,000. Of this number probably more than 500,000 perished, esults of the war, mass persecution and starvation. Of the re- nder, about half came under the domination of Germany; the r half under the domination of the soviet union, which nted in 1940 probably more than 4,000,000 Jews, and had the est Jewish population in Europe, surpassed only by the United es of America, where the number of Jews could be estimated nore than 4,500,000. From most central European countries s have emigrated during the last years to western Europe, the ed States, Latin American countries, Palestine and the far . Frequently they had to resume their migration after a f period, so that the distribution of Jews was in these last s in a state of permanent fluctuation. Thus many German Jews in the years of 1933–38 settled in Italy and were welcomed e, had to leave the country after the introduction of the na- al socialist racial theory by the Italian government, and many an Jews had to follow. Central European Jews who had set- in France, the Netherlands or Belgium in the years between 3 and 1939 found themselves in 1940 forced to emigrate. The ad of the war and the disruption of means of communica- , on the other hand, made large migratory movements diffi- and almost impossible. But in any case the movement of ration and of shift in the distribution of the Jewish popula- of the earth has not yet come to its end. (*See* also ANTI- ITISM; REFUGEES.) (H. KO.)

terbug: *see* DANCE.

ins Hopkins University, Baltimore, Md.; president, Isaiah Bowman, Ph.D., D. Enrolment for 1940 in the several schools of the university as follows: school of higher studies of the faculty of philos- y, 276; engineering, 387 (including 55 graduate students); and sciences, 396; business economics, 87; medicine, 297; iene and public health, 150. Enrolment in the afternoon and ning courses was 3,222 and in the summer school, 908. At the of the fiscal year the endowment of the university was valued $30,354,242.54 and income from all sources for the year was $32,622.97. The following appointments to the faculty of osophy were announced during the year: Dr. Benjamin Har- n Willier became Henry Walters professor of zoology; Dr. ro Salinas, professor of Spanish literature; Dr. Henry T. vell, professor of Latin; Dr. Charles A. Beard, professor of erican history for the year 1940–41. Construction was begun he new biological laboratory as a memorial to the late Ottmar rgenthaler, inventor of the linotype. Funds for the building been left to the university by his son, Eugene G. Mergen- ler.

nes, Jesse Holman (1874–), U.S. secretary of commerce, was born in Robertson nty, Tenn. on April 5. At Dallas, Tex., in 1895 he became nager of a lumber company and seven years later organized his firm. In 1909 he established the Texas Trust company of uston, later the Bankers Mortgage company. He also engaged extensive real estate operations and bought control of the uston *Chronicle*, of which he is publisher. President Hoover ointed him a director of the Reconstruction Finance corpora- in 1932 and he became chairman the following year. In July 1939, pursuant to the regrouping of governmental agencies under the president's reorganization plan, Jones was appointed administrator of the Federal Loan agency. On Sept. 13, 1940 President Roosevelt nominated him secretary of commerce to succeed Harry L. Hopkins, after congress had enacted a special law permitting him to retain the office of federal loan administrator. The senate confirmed this nomination the next day and he was sworn in Sept. 19. On Dec. 4 Jones stated his belief that Great Britain was a "good risk" for a war loan from the United States.

Judaism: *see* JEWISH RELIGIOUS LIFE.
Jugoslavia: *see* YUGOSLAVIA.
Julius Rosenwald Fund: *see* ROSENWALD FUND, THE JULIUS.
Jumping: *see* TRACK AND FIELD SPORTS.
Junior Colleges: *see* UNIVERSITIES AND COLLEGES.

Jute. The area planted to jute in India in 1940 exceeded all previous years, 4,112,750 ac., or 951,850 ac. more than in 1939. Most of the increase was in Bengal, where the acreage was 3,454,450, or 904,850 more than in 1939. The previous high acreage in India was 3,600,000 in 1927. In contrast with this expanded acreage was the reduction in jute mill operations in 1940, the tardiness of deliveries because of a shortage of ocean shipping, declining demand and prices during the latter part of 1940 substantially lower than in 1939. On Aug. 19 the Indian jute mills association reduced working hours from 54 to 45 a week. Later, operations were suspended a part of each month in an effort to regulate output and maintain prices. With the surrender of France in the summer of 1940 India lost a large part of its market for jute. Although in March the British government ordered 52,000,000 yd. of jute for sand bags, there was a decline in this wartime demand for jute at a time when it was estimated that one-sixth of the looms in the Indian jute mills association were making sand bags. Dundee, Scotland (the United Kingdom centre of jute manufacturing) also reduced operations. Since the beginning of the war in Europe the United States has become India's third largest customer for exports, one-half the value of those exports being represented by jute imported into the United States for potato and other burlap bags. Indian jute, however, has felt increasing competition from the growing use of cotton bagging in the United States because of the cotton surplus in that country. (S. O. R.)

Juvenile Delinquency. According to reports from the Federal Children's bureau, juvenile court statistics are received on a state-wide basis from eight states, and from 34 courts in 20 additional states, and from the juvenile court of the District of Columbia. In the year 1940 reports were available concerning the number of cases disposed of in 461 courts representing approximately 38% of the population of the United States. In 1939, 83,628 cases were disposed of by juvenile court methods as compared with 74,972 the previous year. White children represented 79%, Negro children 21%, making a 5% decrease in delinquency for Negro children. Children of other races accounted for less than 1%.

There was an increasing tendency to extend juvenile court methods to cover a larger proportion of child offenders. Yet, it is to be noted that police and adult courts handled large numbers of youthful offenders in the United States. Youths less than 21 years of age constituted some 20% of all persons arrested, including almost 13% of the murderers and 53% of the automobile thieves.

An analysis of 104,000 cases of larceny investigated by the federal bureau of intelligence shows that 64·9% of the property

involved was between $5 and $50 in value. These petty offences were committed by young persons. Reduction in juvenile delinquency was noted in communities which have established child guidance clinics, and the increased use of parks, school playgrounds and swimming pools for children, supported by public recreation centres.

New York city reported a decided decrease in the number of youthful offenders arrested.

Michigan during 1940 extended the use of the Michigan Child Guidance institute, examining more than 500 children, and working out a new technique for relating clinical services through the co-operation of community agencies. The juvenile court of the District of Columbia extended its work and established a new court building in Washington.

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Kallió, Kjösti (1873–1940), ex-president of Finland, died in Helsinki Dec. 19, as he was about to take a train for home after seeing the election of his successor, Risto Ryti. For a biographical sketch see *Encyclopædia Britannica,* vol. 13, p. 246.

Kameroons: *see* BRITISH WEST AFRICA; FRENCH COLONIAL EMPIRE.

Kansas, a central state of the United States admitted Jan. 29, 1861, popularly known as the "Sunflower state"; area, 81,774 sq.mi.; population according to the U.S. census of 1940, 1,801,028, a decrease of 79,971 or 4·3% from 1930. In rank this placed the state in 29th place in comparison with 24th in 1930. The state weathered the depression-drought decade (1930–40) with the highest degree of population stability in its history. The net loss in population was not the result of an abnormal or even of a higher rate of emigration than usual from the state, but was the outcome of a sharp decline in replacement immigration entering the state.

Capital, Topeka (U.S. census 1940), 67,833, an increase of 5·8% over 1930. Topeka was the third city in size, the largest being Kansas City, 121,458, a decrease of 0·3% in 1940 from 1930 and Wichita, 114,966, an increase of 3·5% during the decade. Of the state's population (1940) 753,941 were urban or 41·9%. In 1930 63,344 were Negro; 1,723,131 were native-born white and 69,716 were foreign-born.

History.—In the biennial election of 1940 all executive officers, Republicans, were re-elected, together with a Republican legislature: Payne H. Ratner, governor; Carl E. Friend, lieutenant governor; Frank J. Ryan, secretary of state; George Robb, auditor; Walter E. Wilson, treasurer; Jay S. Parker, attorney-general; George L. McClenny, superintendent of public instruction; Charles F. Hobbs, commissioner of insurance; William C. Austin, state printer. On the presidential ticket, Wendell L. Willkie (Rep.) received 489,160 votes, Roosevelt (Dem.) 364,725. Governor Ratner received a majority of only 430 votes. The governorship was decided by outstate absentee ballots and the defeated candidate, William H. Burke, unsuccessfully challenged the constitutionality of the outstate voting law. The legislature of 1941 was expected to enact a civil service law in accordance with a constitutional amendment adopted at the election of 1940. Other major legislative measures are the tax and school codes prepared for consideration of the legislature in furtherance of the codification program.

Education.—The State had in 1940 more than 200 public libraries, of which more than half were tax supported. There were 15 public and six private junior colleges, 15 private four-year colleges, one municipal, and five state-supported institutions [illegible] collegiate grade. For the school year 1936–37, the last for wh[illegible] data are available, there were 6,636 one-teacher district scho[illegible] in operation with an enrolment in the eight elementary grades [illegible] 83,100. There were 985 two or more teacher districts (exclud[illegible] cities of first and second class) with enrolments in the element[illegible] grades of 83,769. The 88 cities of first and second classes [illegible] elementary enrolments of 119,980.

Agriculture, Manufactures, Mineral Production.—Accord[illegible] to the federal-state estimates of Dec. 1940, the year's field c[illegible] production was the best in eight years, 30% above 1939 and 9[illegible] of the ten-year (1926–35) average. In value it was estimated [illegible] 22% above 1939. In spite of the record low of 35% of nor[illegible] condition in Dec. 1939, the winter wheat crop yielded 123,848,[illegible] bu. as against 111,657,000 bu. in 1939 and a ten-year aver[illegible] (1929–38) of 135,972,000. The harvested acreage was 8,857,[illegible] ac., the smallest since 1935 and abandonment of planted wh[illegible] acreage was 29% or slightly less than in 1939. Corn product[illegible] from 2,647,000 ac. was 41,028,000 bu., as against 37,220,000 [illegible] 1939 and the ten-year average of 67,786,000. Production [illegible] other crops was similarly better than in 1939. Winter wh[illegible] planting in the fall of 1940 was 12,996,000 ac. as against 12,91[illegible] 000 for 1939, which was reported by the U.S. department [illegible] agriculture as of Dec. 1 at 88% of normal condition and [illegible] highest since 1930. In mineral production during 1939, Kan[illegible] ranked third among the states in zinc, sixth in lead, tenth in [illegible] ment, fifth in salt, fifth in natural gas and sixth in petrole[illegible] The state industrial commission achieved little in tangible resu[illegible] for the year. Except for the building of aeroplanes at Wich[illegible] the state shared little in the armament program during 1940.

(J. C. MN.)

Kantorowicz, Hermann (1877–1940), German scho[illegible] was born in Posnan, Pola[illegible] Nov. 18. He was educated at the universities of Berlin, Gene[illegible] Heidelberg and Munich and was a member of the faculty of [illegible] University of Freiburg from 1908 to 1913. He served in [illegible] German army throughout the World War of 1914–18. He beca[illegible] professor of jurisprudence and criminal law at the University [illegible] Kiel in 1929 but was dismissed in 1933 and went to the Uni[illegible] States. He had written much on the causes of the war and had [illegible] serted that German belief in the "myth" that England was [illegible] circling the empire was the basic cause. In the United Stat[illegible] where he remained a year, he lectured at Columbia universi[illegible] the College of the City of New York and the University in P[illegible] ile, in the New School of Social Research. He joined the facu[illegible] of the School of Economics in London in 1934 and in 1937 [illegible] appointed assistant director of research in law at Cambridge u[illegible] versity, later becoming director. He died in Cambridge, Feb. [illegible]

Kazakh S. S. R.: *see* UNION OF SOVIET SOCIALIST REPUBLI[illegible]

Keitel, Wilhelm (1882–), German soldier, born Se[illegible] 22, was a commander of artillery dur[illegible] the War of 1914–18. On April 1, 1934, he was promoted to ma[illegible] general and the following year, when Germany introduced c[illegible] scription, he took charge of the personnel section (*Wehrmach[illegible] amt*) in the war ministry, and was thus connected to a cert[illegible] extent with the re-occupation of the Rhineland in 1936, and w[illegible] the dispatch of German reinforcements to Nationalist Spain. [illegible] Feb. 1938, during Hitler's "army purge" of Gen. von Blomb[illegible] and other conservative members of the high command, G[illegible] Keitel was appointed chief of the supreme command of the G[illegible] man armed forces. He thus directed operations against Pola[illegible] Norway, the Netherlands, Belgium, France and Britain in 1[illegible]

1940. On June 22, 1940 he signed the German-French armi- and on July 19 he was created field marshal by Adolf Hitler. ing the fall of the year he accompanied Hitler on his various s to Mussolini, Franco, Pétain and Laval. His meeting with an Chief of Staff Badoglio at Innsbruck Nov. 15 led to re- s that he might assume command of the axis forces in Africa, these rumours were denied.

ntucky, an east south central state of the United States, admitted June 1, 1792, popularly known as the ie Grass State," area 40,598 sq.mi.; population (U.S. census,) 2,845,627, an increase of 231,038 or 8·8% over that of . Capital, Frankfort, 11,492; largest city, Louisville, 319,- Other cities include Covington, 62,018; and Lexington, 49,- Of the state's population, urban residents numbered 849,327 ons; rural residents numbered 1,996,300. On April 1, 1940 e were 731,189 dwelling units, of which 30,297 were reported int. Of the state's 120 counties, 105 gained in population ng the decade. Among these, Jackson county gained 56%. nsboro grew most rapidly among the cities, gaining 32%.

istory.—In the national election Nov. 5, 1940, Roosevelt m.) electors carried the state by 557,222 votes to 410,384 the Republicans. The Socialist vote was 1,014; the Prohibi- , 1,440; there was no communist ticket. Senator A. B. ndler (Dem.) defeated W. B. Smith (Rep.) by 561,151 votes 01,812, for the U.S. senate. A Republican, John M. Robsion, elected in the 9th district—eight other districts electing iocrats to Congress. The general assembly of 1940 approved gislative program which supplemented and co-ordinated many onal objectives, such as housing projects, rural credits and ervation plans, adjusting them to local conditions. The first conservation district to stop erosion and retire marginal ts from cultivation was created in Logan county. Other ds were appointed to investigate farm tenancy; supervise ributions of surplus U.S. food commodities; certify WPA kers and CCC boys to their respective officers. Considera- s of public health and safety doubtless required the passage of iw which prohibits ophiolatrous practices in any religious ice or gathering.

ducation.—The per capita distribution of the common school d, designed to assist the poorer districts, was $12.33, the high- ever made. A constitutional amendment is proposed for Nov. 1, to apply 10% of this fund to the most needy areas, regard- of regular enumeration. The school census of 1940 was ,429 pupils.

onsolidation of small high schools continued in various coun- where a full program was not feasible. Under a new law, , school buses must transport pupils of private as well as lic schools. The Teachers' Retirement Fund law of 1938 was lemented with $500,000, beginning Jan. 1, 1941, and only 5 of the 18,830 teachers declined to participate in the plan.

harities and Correction.—Governor Johnson Dec. 11 ap- nted W. A. Frost, former chairman of the board of parole, as mmissioner of public welfare, replacing Miss Woll, resigned. state deferred the payment of benefits to 3,628 needy blind, ding a court decision. At Ashland was established a new eral prison.

Health and Welfare.—The death rate was 10.4 per 1,000 pop- tion in 1939, compared with 9·9 in 1938. After Jan. 1, 1941, lth certificates were required of all applicants for marriage nces. Prominent leaders who died during the year were C. W. Beckham, ex-governor and Maurice L. Galvin, Repub- n lawyer. Mammoth cave will become a national park y 1, 1941.

Finance.—In the fiscal year which closed June 30, 1940, the receipts in the general fund were $26,974,424; expenditures $25,858,668, excluding highway and other special accounts, such as bridges. Two interstate bridges, at Ashland and Henderson, will be toll-free early in 1941. The state treasury debt fell from $6,953,703 to a minimum of $4,097,000 Dec. 31, 1940—smallest in 26 years. County finances, however, failed to improve during the year, due to former issues of county bonds for schools, roads, and public works. Perry county filed suit in bankruptcy under the national law, and 25 other counties defaulted principal sums or interest. To assist such, and restore public credit, a state local finance officer supervised all new bond operations through the department of revenue. The corporation income tax yielded $1,945,205; personal incomes, $2,351,257; inheritances and estates $1,200,107 in the latest fiscal year.

Agriculture and Manufactures.—Tobacco, the chief crop, yielded in 1940 295,890,000 lb., being somewhat smaller than that of 1939—342,100,000 lb. A total amount of 295,419,000 lb. was sold on 22 state floors at an average of 17·73 cents per lb. in the 1939–40 season. Of the other crops of 1940, corn yielded 70,400,000 bu.; wheat 5,625,000 bu.; oats 1,260,000 bu.; Irish potatoes 4,140,000 bu., and sweet potatoes half that amount. The fruit crop was negligible commercially. In October, 39 distilleries were in operation, and Kentucky stood first among the states in the production of whisky. Price advances were hastened by increased taxes from $1.04 to $1.20 a gallon, as well as by the Fair Trade state law. In rural electric service Kentucky declined from 39th to 41st place among the states.

The production of coal in 1939 was 42,310,995 tons, mined by 54,693 men. Fatal accidents numbered 139, an increase of 41 over 1938. Of these, 28 fatalities occurred in one mine. Petroleum amounted to 5,518,449 barrels. There are no accurate data for the yield of natural gas.

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(E. T.)

Kentucky Dam: *see* TENNESSEE VALLEY AUTHORITY.
Kenya: *see* BRITISH EAST AFRICA.

Kidnapping. During 1940, kidnappings in the United States dropped to the lowest level recorded since 1932. Of the 12 cases reported, only one was featured by a demand for ransom, as contrasted with ten such demands in 1933. Kidnappings jointly investigated by the federal bureau of investigation and local police authorities under the terms of the Federal Kidnapping act of 1932 are shown in Table I.

Table I.—*Kidnappings Investigated in U.S., 1932–40*

Year	*Total Number of Kidnappings*	*Number Wherein Ransom Demanded*
1932 (from June 22)	5	5
1933	14	10
1934	18	5
1935	26	1
1936	31	1
1937	20	4
1938	37	5
1939	20	0
1940	12	1

All but two of the 194 cases arising during the period 1932–40 were solved. There were 378 convictions in federal and state courts, with 12 death sentences, 43 for life imprisonment and the balance for varying terms with a total of 4,368 years, 7 months and 13 days. Eight kidnappers committed suicide, eight were killed while resisting arrest, seven died by murder at the hands of their confederates in crime and two were lynched. On Dec. 31, 1940, 20 persons were under indictment for violations of the federal act. Some of these were already serving sentences

for other crimes. The work of the federal bureau of investigation in this difficult field continued to elicit enthusiastic popular approval.

Outstanding case of the year was that of three-year-old Marc L. M. E. de Tristan, who was kidnapped from the custody of his nurse in Hillsboro, Calif., on Sept. 20, 1940. A note demanding $100,000 ransom was left behind. The kidnapper was later seized in El Dorado county, Calif., by two lumbermen acting on the basis of published descriptions. The boy was returned to his home, unharmed, on Sept. 22, 1940. W. J. Muhlenbroich, a German alien with 24 aliases, confessed the crime, was indicted, pleaded guilty and on Oct. 4, 1940 was sentenced to life imprisonment in the state penitentiary.

A reported link between this case and the Mattson kidnapping of several years ago was shown to have no factual basis.

Official reports of kidnapping in England are confined to stealing children under 14 years of age. The record since 1900, summarized to the latest date for which official reports are available, appears in Table II.

Table II.—*Record of Kidnappings in England since 1900*

Five Year Averages		*Annual Totals*	
1900–1904	15	1935	4
1905–1909	10	1936	3
1910–1914	7	1937	7
1915–1919	8	1938	5
1920–1924	4		
1925–1929	4		
1930–1934	5		

There were three kidnappings in Shanghai between Oct. 10 and Nov. 29. R. Bullen, Sr., was held by robbers in Jerusalem on Oct. 14, but was later released unharmed. Similarly, J. W. Reid was taken by bandits in Mexico City on Oct. 27, only to be released on the following day. On Nov. 1, 1940, I. Haugen, a Norwegian resident of Brooklyn, N.Y., charged that he had been kidnapped and robbed by persons whom he described as "pro-nazis."

Special interest attached to the support extended by U.S. Attorney General Robert H. Jackson to a proposed statute that would authorize police to have recourse to wire tapping in kidnapping investigations. (*See* also FEDERAL BUREAU OF INVESTIGATION.)

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Kingsley Dam: *see* DAMS.

Kirghiz S. S. R.: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Kiwanis International. Kiwanis International is composed of 2,146 clubs and 110,000 members located in communities throughout the United States and Canada. The first United States club was organized in Detroit in 1915. In Canada the first club was built in Hamilton, Ontario, Nov. 1916. A club is composed of two representatives from each business, professional and agricultural classification. These men are brought together to render civic and social service to their communities and to aid in the solution of community, state, national and international problems.

International headquarters: 520 North Michigan avenue, Chicago. President, Mark A. Smith, Thomaston, Ga.; acting secretary, George W. Kimball, Chicago.

Knights of Columbus. Founded in 1882, in New Haven, Conn., by the Rev. Michael J. McGivney and a small group of Catholic men, this order has become one of the most numerous and powerful Catholic societies of laymen in the United States. It is dedicated to the defence and preservation of Catholic principles.

The 58th annual supreme council convention was held Indianapolis, Ind., Aug. 20–24, 1940. Attending the convent were 265 officers, and delegates from 60 state councils of No America. They represented 2,475 local councils, with a t membership of 412,010, scattered through 48 states, the Ameri possessions, 9 Canadian provinces and Spanish America. In ance members numbered 217,570, with more than $255,000 of protection in force. During 1940, about $2,751,000 were p in death benefits, and $438,000 in old age benefits.

The program of activities stressed religious, patriotic and surance projects. Through resolutions at the annual convent the order tendered to the government and to the Catholic bish services and assistance toward the welfare of the military naval forces in the defence program. The Canadian councils lected nearly $500,000 for military and naval welfare work.

Increased activities were undertaken in sponsoring Cath radio programs, stimulating study clubs and forums, co-operat with the Legion of Decency in motion pictures and decency literature campaigns, combating subversive groups, promot religious observances and services.

The supreme council officers in 1940 included: supreme knig Francis P. Matthews, Omaha, Neb.; deputy supreme knig John E. Swift, Mass.; supreme secretary, Joseph F. Lamb, N. supreme treasurer, Daniel J. Callaghan, D.C. Headquarters the supreme council are at New Haven, Conn.

The official organs are the monthly, *Columbia,* the *N Weekly* and the monthly of the Boy Life Bureau, the *Columb Squires Herald.* (F. X. T.

Knopf, S. Adolphus (1857–1940), U.S. physician, born in Halle-on-the-Saale, Germa Nov. 27, and was educated at the University of Paris and Bellevue hospital medical college in New York city. Upon arrival in the United States he taught languages in Califor then went to New York city in 1886 to study medicine. Af practising for a while in Los Angeles, he continued his medi studies in Paris, and then settled permanently in New York c in 1896. From 1908 to 1920 he was professor of phthisiothera at the New York Postgraduate medical school and hospital. was the founder of the New York city and the National Tuber losis associations and was one of the most active men of profession in combating the disease. He died in New Y city, July 15.

Knox, (William) Franklin (1874–), U.S. publish statesman and soldier, beca known in 1940 as a pre-eminent apostle of U.S. preparedness U.S. assistance to Great Britain in the prosecution of the w After his appointment June 20, 1940 as secretary of the na Knox became an outspoken opponent of appeasement and clared in a speech at Boston on Nov. 14 that Hitler was fanatic, greedy for domination of the world. In this address said that the United States would not "appease anybody earth." On Dec. 20 Knox was appointed to the four-man Of of Production Management, the "super-defence council" hea by William S. Knudsen.

Born Jan. 1 at Boston and educated at Alma (Mich.) colle Col. Knox joined Theodore Roosevelt's Rough Riders, with wh he served from April to Sept. 1898. Commissioned a major 1917, he was in France from May 1918 to Feb. 1919 and beca colonel in the 365th field artillery. His newspaper career be shortly after his service in the Spanish-American war when was successively reporter, city editor and circulation mana of the Grand Rapids, Mich., *Herald.* From 1901 to 1912 he

sher of the Sault Ste. Marie, Mich., *News* and in 1913 he hased control of the Manchester, N.H., *Union and Leader*. r he became associated with the Hearst newspaper chain and its general manager until 1931, when he became publisher e Chicago *Daily News*. In 1936 Col. Knox was the Repub- candidate for vice-president.

dsen, William Signius (1879–), U.S. industrialist who became in 1940 the ng personality in U.S. production for defence. He was born penhagen, Denmark, on March 25 and as a youth worked in ycle shop in his native town. At the age of 20 he emigrated e United States, where he found work in a shipyard in New .. After working in a railroad shop for a year and a half he to Buffalo, where he ultimately became superintendent of a He then worked for Ford Motor company and became asso- d with Chevrolet Motor company, of which he was made president in 1922 and later president. From 1933 to 1937 as executive vice-president of General Motors corporation, in the latter year he became president. On May 28, 1940 dent Roosevelt appointed him commissioner of industrial uction for the new national defence advisory commission.

is position assumed increasing importance during the re- der of the year and although the commission had no chair- with authority until Dec. 20, Knudsen was recognized as its outstanding member. On Dec. 13, in an address in New city, Knudsen stated frankly that the preparations for na- l defence were far behind schedule and blamed public leth- for the situation. On Dec. 16 he called the attention of ine-tool manufacturers to the "terrible urgency of the situ- n." On Dec. 20 he was appointed chairman of the new Office roduction Management, a "super-council" of four men with ullest authority for producing war materials, procuring the ssary supplies for production and determining priorities in ary orders. The other members were secretaries Knox and son and Sidney Hillman (*qq.v.*).

ler, Walter Jodok (1875–1940), U.S. manufacturer, was born in Sheboygan, Wis., ch 3. He was educated in the public schools and at the age 5 went to work in his father's plumbing supplies factory. n his father died in 1900 he and his brothers continued and nded the business and built around it a model town which named for their father. The Society of Arts and Sciences him a medal in 1934 "for conspicuous service to humanity," cognition of what he had done to benefit his employees. He elected governor of Wisconsin in 1928 as a Republican after ating the La Follette faction in the primary. He was defeated renomination by Philip La Follette in 1930, but defeated the r in the primaries of 1932, though he lost the election in the sevelt landslide of that year. He died in Kohler, April 21.

oye, Fumimaro (1891–), Japanese prince and statesman, was born at Kyoto in Octo- son of Prince Atsumaro Konoye and descendant of one of n's oldest families. He graduated from Tokyo Imperial uni- ity's law college in 1917 and was a member of Prince Sai- 's delegation to the Paris peace conference the following year. r serving in the house of peers he was prime minister in 7–39 and subsequently minister of state without portfolio and ident of the privy council.

1940, after the resignation of Adm. Yonai (*q.v.*), he again me prime minister. Upon the installation of his cabinet 23 political observers predicted that his government would decidedly toward fascism. On Aug. 1 the government an- nounced that it would pursue a totalitarian policy which would include Japanese domination over Asia and on Aug. 15 the Min- seito party, largest in Japan, was dissolved. But shortly there- after Konoye announced, after an audience with the emperor, that he did not propose to set up a single-party state because "the privilege of assisting the throne cannot be monopolized by a single individual or a single party."

Konoye's principal preoccupation in foreign matters, aside from the Chinese and French Indo-Chinese "incidents," was his nation's relations with the United States. The unexpectedly strong reaction of the U.S. to the Axis-Japanese pact of Sept. 27 caused Konoye and members of his government to assert their peaceful intentions toward the western hemisphere. (*See* JAPAN.)

Korea: *see* CHOSEN.

Kubelik, Jan (1880–1940), Bohemian violinist, was born in Miehle near Prague, and died in Prague, Dec. 5. For a biographical sketch see *Encyclopædia Britannica,* vol. 13, p. 509.

Kuwait: *see* ARABIA.

Kyanite. Its adaptability for the production of special high temperature refractories has led to a gradual increase in the demand for kyanite, which has been supplied by production from North Carolina, South Carolina, Georgia, Virginia and California and by imports from India, where production amounted to 28,835 long tons in 1938. Imports into the United States were 3,881 short tons in 1939, all from India and production is estimated at 2,950 tons. The related minerals, sillimanite and andalusite, which have the same chemical composition as kyanite, but a different crystal structure, are also used for the same purpose. (G. A. RO.)

Labor, U.S. Department of: *see* GOVERNMENT DEPARTMENTS AND BUREAUS.

Labour: *see* AMERICAN FEDERATION OF LABOR; CONGRESS OF INDUSTRIAL ORGANIZATIONS; LABOUR UNIONS; LAW (CASE): *Labour;* RELIEF; STRIKES AND LOCK-OUTS; SUPREME COURT OF THE UNITED STATES: *Labour;* UNEMPLOYMENT; WAGES AND HOURS; UNITED STATES: *Labour Problems;* MOTION PICTURES; NEGROES (AMERICAN); RADIO, INDUSTRIAL ASPECTS OF. *See* also under various States.

Labour Party. At the British Labour party conference held in May 1940, the affiliated membership represented was 2,766,000 as compared with a total membership of 2,663,000 in 1939. Of the 1940 total, trade unions accounted for 2,224,000 and the individual membership of local labour parties for 487,000—this latter figure showing a substantial increase over the previous year. In consequence of the by-election truce the membership of the party in the house of commons remained unchanged in substance; but two members previously expelled from the party on account of their association with Sir Stafford Cripps's "Popular Front" campaign were readmitted to membership, while D. N. Pritt, K.C., was expelled on account of differences upon war policy. A former leader of the party, George Lansbury, died on May 7, 1940. As a pacifist, he had been out of harmony with the party's official policy for some time before his death; but all sections of the labour movement held him in high affection and respect, and his death removed nearly the last of the leaders who had been associated with the political labour movement from its very early days.

The Labour party gave from the outset its full support to the nation's war effort. But it remained technically in opposition in the house of commons until Winston Churchill succeeded Neville Chamberlain as prime minister in May 1940. On the reconstruction of the government, two members of the party entered the war cabinet, C. R. Attlee, the parliamentary leader, becoming lord privy seal, and Arthur Greenwood, the deputy leader, minister without portfolio in charge of certain important tasks of economic co-ordination. At the same time Herbert Morrison, previously leader of the London County council, became minister of supply; A. V. Alexander, the chief parliamentary representative of the co-operative movement, first lord of the admiralty; Hugh Dalton, minister of economic warfare; and Ernest Bevin, the secretary of the Transport and General Workers' union, minister of labour and national service. Other labour members entered the government in less important offices.

These changes necessitated a reconsideration of the party's work in the house of commons. It was decided to maintain a "shadow" opposition for the purpose of keeping up free discussion; and H. B. Lees Smith, a former postmaster general, was elected as acting leader of the party. In October, Ernest Bevin was added to the war cabinet, and Herbert Morrison was transferred from the ministry of supply to the home office.

After the collapse of France, the Labour party played a leading part in organizing a more intensive war effort to meet the emergency. Long hours had to be worked in the new factories in order to re-equip the army and speed up the output of aeroplanes and other munitions of war.

The local Labour parties worked in 1940 under great difficulties. Many of the party's best leaders and organizers were fully engaged in various forms of war work; and in municipal affairs many local councils had handed over their work largely to small emergency committees. Efforts were made to maintain party activity by special local and regional conferences and by other means; but the suspension of both national and local elections meant that many of the normal activities were no longer called for. In view of these conditions and of the extensive calling up of members for the armed forces, the maintenance of the party's individual membership indicated a substantial growth of its real influence. (G. D. H. C.)

Labour Unions. The military defence program of the United States government dominated developments in the labour movement during 1940. The first and most potent effects of this program were a vast expansion in government appropriations and contracts for defence materials. As a result production increased rapidly in the defence and allied industries and a wave of re-employment got under way. By the last quarter of the year there were indications that the bulk of the employable unemployed of the country might easily be absorbed by industry in the course of 1941. This hope drastically changed the whole labour outlook. The chances for the further growth of trade unionism looked more promising than at any time since 1936–37. Wages and working conditions began to reflect the influence of more favourable conditions of business. The relations of the government to organized labour assumed the forms usually associated with times of national emergency or war.

The course which the government's policy toward organized labour would pursue was indicated by the appointment of Sidney Hillman, president of the Amalgamated Clothing Workers of America and vice-president of the C.I.O., as a member of the defence advisory commission—the federal agency charged with administering the defence program. Aside from his general functions as a member of the commission, there devolved upon Mr. Hillman the special tasks of securing to industry an adequate supply of labour and preventing strikes or lock-outs. He sho associated with himself a joint trade union committee, comp of the presidents of leading unions affiliated with the C.I.O. the A.F. of L., to advise with him concerning matters of def labour policy. Mr. Hillman's appointment greatly enhanced influence of union labour in United States industry and ac to his prestige in the labour movement. Due to the variet duties which it was called upon to assume, Mr. Hillman's o superseded many of the functions of the permanent departm of the government, notably those of the department of lab In Jan. 1941 the position of organized labour was fur strengthened when the president, in setting up a supreme def council, the office of production management, designated Hillman as its associate director.

In spite of improving business, strikes during 1940 were c paratively few and brief. The number of strikes, the numbe workers involved and the number of days lost were the sma in many years. Only during the last quarter of 1940 did str appreciably increase, but even then they were speedily sett The quiet of this period was unexpected and was variously tributed to the effects of the National Labor Relations act, pro and effective intervention in threatened disputes by agents Mr. Hillman's office, and the broadened facilities of the ciliation service of the department of labour. However, pu concern with the defence program and its opposition to de or interruptions in production doubtless played a leading in preserving the peace.

This decline in labour trouble did not prevent the developm of serious issues of labour policy and industrial relations. letting of vast government contracts for defence, estima to reach some $20,000,000,000, made the government virtu the largest employer of labour in the country. The unions, preciating the significance of this new relation between gov ment and industry, hoped to use it for their own advantage persuading the government to deny contracts to firms refu to recognize organized labour and to make agreements with In particular, the unions sought to employ this method to f leading nonunion firms, such as Bethlehem Steel and Ford sign contracts with the labour organizations claiming juris tion over their employees. As one of its earliest acts, the fence advisory commission advised government purcha agencies that they should observe the labour laws of the cou in awarding defence contracts. This action was generally in preted to mean that firms found to be violating the federal lab law, especially the National Labor Relations act, would be de government contracts. The announcement of this decision arou widespread public discussion because many of the compa affected by it were among the most important suppliers of fence products and because of prevailing dissatisfaction the ways in which the Labor Relations act was being ministered. The questions thus raised were made the sub of hearings by a committee of the house of representatives w had been set up to investigate the Labor Relations act and administration. At these hearings it was disclosed that there no legal sanction for withholding orders from violators of Labor Relations acts, and contracts, therefore, continued to awarded to companies able to meet the requisite specificati Pressure by the unions, however, was not abated and it expected that this question would become one of the most troversial issues of the next years.

At the same time organized labour utilized its forces in o directions to extend the boundaries of its jurisdiction and increase its membership. With increasing production and panding employment, the unions began to make demands higher wages, better working conditions and concessions, s

ıe closed shop and check-off, aimed to strengthen their holds their members. Successful drives for higher wages in the defence industry of aeroplane production and in the machine-industry, which was expanding its capacity many times over easons of defence business, resulted in the unionization of industries and a considerable growth in membership. Wages ned their upward course, which was interrupted by the de-ion of 1938, and stood by the end of 1940 at their highest for all time.

ood business, combined with favourable political conditions, ıer raised union membership during the year. While it is difficult to obtain accurate records of membership, it may be ıated that the aggregate membership of all components of United States labour movement was approaching 8,000,000 ıe last months of 1940. This figure exceeds the previous of 1920 by close to 3,000,000. Many political factors con-ted to these gains. The National Labor Relations board nued to rule in favour of the unions and thereby brought hitherto nonunion firms under union contracts. Strong ts to amend the National Labor Relations act were defeated he opposition of the administration, and the powers of the r Relations board remained uncurbed. The United States eme court, reconstructed through the new appointments made President Roosevelt, consistently sustained the decisions of oard. Thus in the famous Republic Steel case the supreme upheld the board's decision ordering the Republic Steel any to reinstate some 5,000 former employees discharged ıg the strike of 1937. This verdict did much to pave the for the unionization of that part of the steel industry which still unorganized. As in former years, the representatives of al mediation agencies used their influence and prestige to itate union recognition, and the new defence agencies, deal-with labour disputes, began in the course of 1940 to accom-the same purpose. The almost unanimous support by ıized labour of President Roosevelt's candidacy for a third made the results of the November election of great im-ınce to the labour movement. For the re-election of the dent was, under the circumstances, almost a guarantee of continuance of the benevolent labour policies which have ıred his administrations since 1933.

the year's advances the two competing federations, the rican Federation of Labor and the Congress of Industrial nizations, shared. The greatest single gain made by the of L. arose out of the reaffiliation of the International es' Garment Workers which, five years before, had been one ıe founding unions of the C.I.O. This action brought the ration 250,000 members, a gain which was partially offset by suspension of the International Typographical union, with a ıbership of less than 100,000, for failure to pay per capita into a special assessment fund. A more consistent, though spectacular, source of gain was the increasing recognition by Labor Relations board of the right of employees to be repre-ed by craft unions. Although the A.F. of L. lost its fight mend the Labor Relations act, it substantially gained its ctives by persuading or forcing the board to deal more ally with the claims of craft organizations. The federation won a signal victory in blocking the reappointment of J. ren Madden as chairman of the Labor Relations board.

ıe C.I.O. profited mainly from decisions of the Labor Rela-board and the expansion of the defence industries. Its test victory of the year was won in the General Motors' ions, held in April 1940. The employees of all but a few of plants voted to be represented by the United Automobile kers, affiliated with the C.I.O. With the exception of the company, the automobile manufacturing industry was thus

JOHN L. LEWIS bolted Roosevelt in a national broadcast Oct. 25, 1940, and declared his support of Willkie. In the event of Roosevelt's election, he said, he would retire from the C.I.O. He resigned and was succeeded by Philip Murray Nov. 22

brought under the control of a C.I.O. union. In the numerous elections held throughout the year, C.I.O. affiliates were more successful than their rivals in the A.F. of L. or among independent unions. Due to the great growth of defence industries, most of which are under the jurisdiction of the C.I.O., these industries became the largest source of new C.I.O. membership.

As in previous years, the conflict between the C.I.O. and the A.F. of L. defied solution. Internal dissension within the C.I.O., arising out of John L. Lewis' attacks on President Roosevelt and his support of Wendell Willkie, the Republican candidate for president, coupled with reactions against communist influences in many C.I.O. unions, raised hopes of a popular demand for peace in the labour movement. But the internal difficulties were resolved, temporarily at least, by the resignation of John L. Lewis and the election of Philip Murray as president of the C.I.O., and a merger of the two movements seemed, at the close of 1940, as far away as ever. Although the A.F. of L. was disturbed by charges of racketeering against the officers of several of its unions and by a series of government anti-trust suits against some of its leading affiliates, its position with the public and the administration in Washington was apparently improved by reason of the decline in the prestige of John L. Lewis and the fear of communist power in the C.I.O. This change in opinion probably accounts for the appointment of D. W. Tracy, president of one of the largest A.F. of L. unions, the Brotherhood of Electrical Workers, as assistant secretary of labour. (*See* also AMERICAN FEDERATION OF LABOR; CONGRESS OF INDUSTRIAL ORGANIZATIONS; LAW [CASE]: *Labour;* STRIKES AND LOCK-OUTS.) (L. Wo.)

Great Britain.—At the end of 1939 the trade unions in Great Britain had a total membership of 6,234,000, of whom 5,258,000 were men and 976,000 women. The largest groups included in this total were transport (road and docks) and general labour (1,319,000), metal and vehicles (936,000), coal mining (707,000), railways (470,000), national government (428,000) and building and public works (420,000). In comparison with 1938 the largest percentage increases in membership were in the clothing trade

(16·2%), the metal trades (9·8%), national government (6·7%) and agriculture (6·7%). The average increase in all groups was 3%, as compared with increases of 10% in 1936–37 and 3·6% in 1937–38. The Trade Union congress, to which most of the important unions belong, except those in the government service (which are precluded from joining by the Trade Union act of 1927), had in 1940 a total membership of 4,867,000, as compared with 4,669,000 in 1939. The figures for 1939 and 1940 are affected by the calling up of men for the armed forces. Some trade unions, especially in the skilled trades, retain such members on their books; but in many cases they drop out.

The war involved a large-scale redistribution of labour between trades and also between different parts of the country; but no figures showing the extent of these changes were published. Industrial migration was at the expense of the trades producing consumer goods into the metal and engineering trades in particular; while geographical migration was chiefly out of the eastern coastal areas into the midlands and northwest. The policy of the trade unions was from the outset to give the fullest possible support to the war effort; and in the war trades they willingly agreed to accept the temporary abrogation of trade union regulations and the dilution of skilled labour by the upgrading of less skilled workers, with or without a period of preliminary training. The unions further agreed to a system of arbitration in industrial disputes and to the suspension of strikes during the period of the war in all essential trades. The state, however, did not impose any general system of wage-regulation, and wage rates and conditions continued for the most part to be settled by the same processes of collective bargaining as in times of peace. The trade unions were represented, together with the principal employers' organizations, on a National Joint Advisory council over which the minister of labour presides; and this body was consulted in all matters affecting the formulation of general labour policy under war conditions, and also about other matters, such as war finance.

In view of the general support given by trade unionists to the war effort, there was an almost complete absence of serious industrial troubles. Strikes were few and small, and concerned almost exclusively with grievances arising in particular establishments. The work of the ministry of labour in organizing the supply of workers for the essential trades was facilitated, after Ernest Bevin became minister in May 1940, by a Labour Supply board, on which the trade unions had two out of the four seats.

Upon the collapse of France, the trade unions collaborated fully in the intensive effort which was made to speed up war production, waiving rules limiting hours of labour and encouraging the maximum amount of overtime work consistent with health and safety. They pressed hard for improved canteen and air-raid shelter arrangements in the factories and for better transport facilities to and from work which had often to be undertaken far from home. They also acquiesced in the taking by the government of power to order skilled workers to work in a particular factory, when their services were specially needed, though in normal times any such order would have been regarded as a form of "industrial conscription." The Trades Union congress of Sept. 1940 fully endorsed the policy followed by the trade union leaders in aiding the war effort to the full, but urged that steps should be taken at once to repeal the Trade Disputes and Trade Unions act of 1927 (passed after the general strike of 1926), which was widely resented by trade unionists as an unfair and vindictive measure limiting legitimate trade union activities.

France.—In France, the Confédération Générale du Travail was sinking in membership before the war began from the peak reached under the Front Populaire. In view of the communist opposition to the war, the C.G.T. took steps to expel the communist elements; and this involved a further fall in membership. No figures were available; but in any case they would give no indication of the position at the close of 1940, since under the Pétain government the old trade union movement was liquidated and an attempt was being made to replace it by some sort of corporative organization modelled rather on the Italian fascist unions than on the German Labour Front.

(G. D. H. C.)

Labrador: *see* NEWFOUNDLAND AND LABRADOR.

Lacrosse. The 1940 lacrosse season revealed the continued top strength of the University of Maryland as well as the return to power of Johns Hopkins and the fall of the mighty 1939 Navy team. Maryland, completing an undefeated season, inflicted the only loss Johns Hopkins suffered by beating them 7–6.

Navy, losing its best players by graduation, played one of the poorest seasons in its history. Its decline was climaxed by a defeat at the end of the season by its traditional rival, the cadets from West Point.

As in previous years, the strength of the college teams depended on the talent sent from the various prep schools. Consequently, Maryland, Johns Hopkins and Princeton, in getting the cream of the crop, were at the top of the heap. Princeton, though losing to Maryland and Johns Hopkins, beat all other rivals. Swarthmore, playing nearly in its class, was undefeated and won the Pennsylvania league championship. Duke and North Carolina were the best in the Dixie league.

The All-Star Northern team beat the All-Star Southern te for the first time in the history of this annual meeting. King and Turner, both of Princeton, starred for the north, w Brown of Duke and Litz of Loyola sparked the southerners' tack.

Princeton and Maryland each placed two men on the 1940 American Lacrosse team; King for in home and Turner for g both of Princeton made the squad as well as Maryland's two st Mulitz for cover point and Nevares for out home.

During 1940 it was quite obvious that the season's teams w stronger and, as a result, there were more close games than e before.

(T. J. D.)

Lagerlöf, Selma (1858–1940), Swedish novelist, was b in Marbacke, Nov. 20, and died th March 16. For a biographical sketch see *Encyclopædia Britannica*, vol. 13, p. 592.

Laidlaw, Sir Patrick Playfair (1881–1940), English thologist, was born Se 26. He was educated at St. John's college, Cambridge, and Gu Hospital medical school, where he later served as demonstra in physiology and lecturer on pathology. He was internationa noted as one of the leading students of viruses. In the course his studies of the virus causing distemper in dogs he conceiv the idea that influenza in human beings was a kindred disea and in 1933 he isolated the germ. At the Harvard univers tercentenary celebration in 1936 it was reported that his vacc foreshadowed the final conquest of influenza. He died in Lond March 20.

Land Banks: *see* FEDERAL LAND BANKS.

Lansbury, George (1859–1940), British labour leader a pacifist, was born in Suffolk, Feb. 21 a died in London, May 7. See *Encyclopædia Britannica*, vol. p. 706.

Laos: *see* FRENCH COLONIAL EMPIRE.

Larynx: *see* EAR, NOSE AND THROAT, DISEASES OF.

Latin America, also called Hispanic America, is that p tion of the western hemisphere deriving culture and institutions from Spain and Portugal. It includes republics and the United States dependency of Puerto Rico. T language is Spanish, except in Brazil and Haiti, where Portugu and French, respectively, are spoken, and in Puerto Rico, wh English is on a legal parity with Spanish. Indigenous tongues used by large numbers in some regions, notably in Mexico, Gua mala, Ecuador, Peru, Bolivia and Paraguay. The area is appro mately 8,050,000 sq.mi. The population is white, mestizo a Indian, with negroid elements predominant in Haiti and Dominican Republic, and prominent in Brazil and Cuba, a along the coast of the Caribbean countries. The population (19 est.) is about 115,000,000. The chief cities are: Buenos Ai 2,364,263; Rio de Janeiro, 1,848,758; São Paulo, 1,322,6 Mexico City, 1,451,616; Santiago de Chile, 875,790.

During 1940 no political changes were effected by force; serio but abortive revolutions were attempted in Ecuador and Boliv however, and quasi-dictatorships replaced more constitutional g ernments in Panama and Paraguay. Presidential elections du the year brought changes in Cuba, Mexico, Costa Rica, Ecuad Panama and Bolivia. As a consequence of the European war, se ous economic dislocation was generally experienced.

Vith the exception of Bolivia, every country has important cultural resources. Coffee dominates the economy of Brazil most of the Caribbean states; meat and wheat are the main-'s in Argentina and Uruguay, sugar in Cuba. Venezuela, Mex- Colombia, Argentina, Ecuador and Peru are important for oleum. Mexico and the Andean countries of South America, ecially Bolivia, Chile and Peru, are leading metal producers. nufacturing was developing rapidly, especially under the stim- of European war conditions, but is generally quite inade- te for domestic needs. Argentina and Brazil have made the ntest industrial progress. Manufactured goods and foodstuffs e in 1940 the chief imports. Most of the foreign trade was n the United States and Europe, although there was an increas- interchange of goods between the temperate and tropical re- lics. In 1938 and 1939 the United States led in the trade most countries, with Great Britain usually second, and Ger- ny a close third. The United States' share of Latin American eign trade was considerably larger in 1940 than in previous rs.

ommunication was generally inadequate, but highways, espe- ly, and air transport service were being rapidly improved and nded. The Roman Catholic faith is predominant in all coun- s, with, however, a varying degree of relationship with the rch itself. Argentina and Costa Rica have the highest rate literacy. (*See* the articles on separate countries, and PAN ERICAN UNION; HISPANIC AMERICA AND THE EUROPEAN WAR.)

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ter Day Saints: *see* MORMONS.

via, Baltic country of north-central Europe, bounded N. by Estonia, S. by Lithuania and Poland, E. by Russia; 25,016 sq.mi.; population (est. Jan. 1, 1939), 1,994,500. Chief ns (population, 1935): Riga (capital, 385,063), Liepaja (57,-). Language: Latvian; religion, Christian (Protestant, 56%; nan Catholic, 24·5%; Greek Catholic, 9%; Greek Orthodox, %).

listory.—Like its neighbours, the small Latvian ship of state ndered in 1940. The first breach occurred when it was made sign a mutual assistance pact with the U.S.S.R. on Oct. 5, 9, leasing to Russia the use of naval and military bases at baja, Ventspils and other places. At that time its independence guaranteed, but rapidly changing developments in the Baltic soon made it impossible for the corporate authoritarian e led by Karl Ulmanis to withstand the march of the great ers and the division of eastern Europe between Germany the soviet union.

atvia went to the polls on July 14 to vote on the question of usion in the soviet union, the election campaign for union ng managed by the soviet commissar, Andrey Vyshinsky. The e came out as expected and a few days later a delegation left Moscow. President Ulmanis, who had helped write the con- ution of 1918 and had then made himself dictator by an army p in 1934, was removed. Into the leadership of the new onomous soviet state came a 68-year-old veterinarian and teriologist, Prime Minister Kirchenstein. The parliament im- liately moved to nationalize banks and large industries. Mean- e, Britain held Latvian ships in its ports, and the United States e the available assets of all Latvians (the total such assets of three Baltic states amounted to about $2.000,000). American omatic and consular offices were closed on demand of the S.R.

BIBLIOGRAPHY.—*The Baltic States* (London, 1938). (F. D. S.)

PIERRE LAVAL, shown here at his castle near Vichy, was generally considered the "strong man" of the French government after his appointment July 12, 1940, as vice-premier and ultimate successor to Marshal Pétain, but Pétain abruptly dismissed him from all offices Dec. 13

Laval, Pierre (1883–), French statesman, was born June 28 at Châteldon, Puy-de-Dôme. For a brief biographical sketch, see *Encyclopædia Britannica,* vol. 13, p. 774. Laval had remained in comparative obscurity after the start of war in 1939 until he was delegated by Marshal Pétain to draft a new constitution July 5, 1940 after the downfall of France. A week later Pétain named him his successor as well as vice premier. During the succeeding weeks Laval, who had obvious pro-nazi inclinations, made several visits to Paris and occupied France to consult with Hitler (Oct. 22 near Compiègne), Goering and other high German leaders. As early as September a rift was reported between Pétain and Laval, and on Dec. 13 the latter was abruptly dropped from the Vichy cabinet and temporarily interned. The Germans, through High Commissioner Otto Abetz, then apparently intervened on behalf of Laval and secured his release, though Pétain did not restore him to his former high offices. Pétain declared in a broadcast on Dec. 14 that he had dismissed the vice premier "for high reasons of interior policy" which had "in no way any connection with our relations with Germany." This statement tended to support rumours that Laval had attempted to engineer a coup d'état. Prior to his dismissal Laval had also been foreign minister and minister of information. In an interview prior to his conference with Hitler, Laval was quoted as having declared his belief that democracy was dead and that the victory of the axis was only a matter of time.

Lavedan, Henri Léon Émile (1859–1940), French dramatist, was born in Orleans and died in France in August. For a biographical sketch see *Encyclopædia Britannica,* vol. 13, p. 775.

Law (Case). The year 1940 was characterized by the concentration of efforts in behalf of national defence. The government undertook more widespread regulation. Trust-busting under the leadership of the attorney general succeeded in decentralizing many major monopolies. The achievements of labour outnumbered those of any prior year; its feuds

with management gave rise to a clear statement of the scope of freedom of speech and civil rights in general and their application to the realm of industrial disputes in particular. Control was continued over key industries such as agricultural products, coal, motion pictures, utilities and corporate endeavour generally.

Administrative Law.—An Illinois act delegating to administrative officers the power to prescribe the wage rate without setting a standard therefor was held unconstitutional, since it deprived the taxpayer of the benefit to be derived from the right of the employer and employee engaged in public work to contract freely (*Reid* v. *Smith,* Ill. Sup. Ct., Oct. 11). In another case an appeal was sought from a ruling of the Civil Service commission discharging the overseer of a municipal park. The supreme court of Iowa, holding for the plaintiff, ruled that the commission could not act as both prosecutor and judge (*Sandahl* v. *City of Des Moines,* 227 Iowa 1310, 290 N.W. 697). Further representative cases are considered in sections in this article dealing with labour and trade regulation.

Agriculture.—Agricultural regulation has been predominantly concerned with the milk industry. The supreme court of Michigan invalidated the state's Milk Marketing act because it provided for an administrative board composed of persons having pecuniary interest in marketing orders. (*Johnson* v. *Michigan Milk Marketing Board,* Mich. Sup. Ct., Dec. 10.) The Utah Milk Control act was declared unconstitutional as an undue delegation of power, for, in fixing prices, the board was directed to consider the cost of "producing, handling, pasteurizing and distributing" the milk to be sold (*Rowell* v. *State Board of Agriculture,* 99 P. [2nd] 1). The Pennsylvania Milk Control law was held not to apply to milk received by dealers on consignment, for the act nowhere refers to consignment, and administrative boards may not go beyond the zone permitted by the statute (*Green* v. *Milk Control Comm. of Pennsylvania,* Pa. Sup. Ct., Oct. 28).

Aliens.—Conduct of a woman in permitting her name to be included in her husband's certificate of naturalization as a German citizen, and holding herself out as a German citizen since that time, was held evidence of a renunciation of her United States citizenship. Accordingly, the attorney general denied her application for a passport as an American citizen (*Opinion No. 109,* vol. 39, of attorney general, Jan. 25). A child born in the United States and taken by parents to Canada during minority did not lose American citizenship by making, shortly af attaining majority, application for Canadian land patent claim Canadian citizenship by virtue of his father's naturalizati His election to retain United States citizenship may be infer from facts showing that he returned to the United States imm diately after filing such application, took up residence ther and voted (*Doyle* v. *Ries,* Minn. Sup. Ct., Aug. 23).

Anti-Trust.—The latest technique used by the attorney gene is to avoid litigation by compelling the defendants to sign consent decree agreeing to abstain from certain practices a to comply with others.

By the consent decree method the government has undertak through an intensive drive, to eliminate the unreasonable straints effected by labour union activity designed (1) to prev use of cheaper material, improved equipment or more effici methods; (2) to compel the hiring of unnecessary labour; (3) enforce systems of graft and extortion; (4) to enforce illega fixed prices and (5) to destroy an established system of coll tive bargaining.

The attorney general successfully procured the following co sent decrees affecting: (a) military optical instruments (*U.S.* v. *Bausch & Lomb Optical company,* July 9); (b) the buildi trades (*Long Island Sand & Gravel company,* Aug. 22; *Southe California Marble association,* Nov. 12; the *Tile Contracto Association of America, Inc.,* June 10); (c) the milk indust (*U.S.* v. *Borden Co.,* Sept. 16); (d) the motion picture indust (*U.S.* v. *Paramount Pictures, Inc., et al.,* Nov. 20; *U.S.* v. *F West Coast Theatres, et al.,* Nov. 27); and (e) labour (*Arth Morgan Trucking company,* Dec. 3).

Civil Rights.—*Freedom of Speech.*—A circuit court held th the lower court should have dismissed an indictment chargi such a conspiracy to injure and oppress an editor of newspap in the exercise of his right and privilege to write in the new papers editorials exposing and condemning various forms illegal gambling and calling on officials of a city to suppress t gambling and punish the offenders. The right of free speech a of free press, said the court, is guaranteed by the 14th amen ment, "but this effect of the 14th amendment on state action is not enough to bring conspiracies of individuals within t punitive power of congress" under the statute (*Powe* v. *U.* C.C.A. 5th, Jan. 17).

Contempt.—It is not always simple to determine when fre dom of speech ends and contempt begins. In one case a da newspaper of wide circulation published an editorial approvi the verdict of guilty in a criminal prosecution of sit-down strike It praised the jury and the court, discussed the importance the verdict and its effect upon industrial strife being wage In holding the paper for contempt the court noted that referen to "union terrorism and racketeering" can only be construed implying that the convicted defendants had been engaged such activity. (*Times-Mirror Co.* v. *Superior Court of Californ* Jan. 31.) In another case it was held that a federal court h jurisdiction in summary proceedings to adjudicate a person contempt for refusal to answer questions as a witness before grand jury. (*Camarota* v. *United States,* C.C.A. 3rd, April

Libel.—The extent to which freedom of the press is still ch ished is reflected in a libel action by the president of the Wor er's Alliance of California for an alleged charge that the offic of the alliance were diverting relief funds, collected by t individual members from the state, to further communis agitation under direct orders from the Third International. though the plaintiff argued that he was one of the alliance's th paid officers, that the defendant publisher and the chairman

EDITOR RALPH COGHLAN (extreme right) of the *St. Louis Post-Dispa* was sentenced to 20 days in jail and a $200 fine April 3, 1940, for contempt court in criticizing a judge's disposal of an extortion case

Senatorial Investigating committee making the charge in-
ded to refer to the plaintiff, and that many newspaper readers
sonably believed that the plaintiff was designated, the com-
int was dismissed substantially on two grounds: (1) that
publication did not defame an ascertainable person and (2)
t freedom of the press should not be unduly restricted where
nment upon matters involving public policy is concerned.

Privacy.—In *Sidis* v. *F-R Publishing Corp.* (113 F. [2nd] 806,
.A. 2nd), the plaintiff had been a greatly publicized child
digy. Upon reaching maturity he suffered a general break-
vn and thereafter went to great efforts to live in complete
curity, with comparative success until defendant printed an
cle reviewing in intimate detail plaintiff's life history and the
ts and circumstances of his present humble existence. Plain-
s action for violation of his right of privacy was dismissed
the ground that a quondam public character is still of in-
est to the public, justifying the probing of his privacy.

Obscenity.—The United States Circuit Court of Appeals for
District of Columbia decided that an imported book entitled
dism in Modern Life is not subject to confiscation and de-
iction on the ground that it is obscene within provisions of
Tariff act of 1930 by reason of the presence therein of three
four photographs in which appear full front pages of nude
iale figures, and two photographs in which nude male and
iale figures appear together.

Nudity, the court ruled, is not obscene *per se* and under all
umstances. "Civilization has advanced far enough, at least,
permit picturization of the human body for scientific and
cational purposes."

Constitutional Law.—A discriminatory salary schedule fixing
igher minimum wage for white teachers than for Negroes of
al qualifications and experience, and performing the same
ies, was held unconstitutional (*Alston* v. *School Board of*
y of Norfolk, 112 F. [2nd] 992 [C.C.A. 3rd]). The state of
seller of securities may tax an interstate sale of securities
en it levies a similar tax on intrastate sales and where the
y to pay is imposed on the seller rather than on the purchaser
Kane v. *State,* 283 N.Y. 439, 28 N.E. [2nd] 905). A state
y also issue bonds within its debt limits, for military appro-
itions (*in re Opinion of the Justices,* 13A [2nd] 33 [*Maine*]).

Copyright.—A three-judge federal court invalidated a Florida
ute which outlawed combinations of composers, authors and
lishers constituting a substantial number of those having
its in musical compositions thereof. The combination pur-
ted to fix prices for the rights to perform copyrighted music.
holding the provisions of the particular statute unreasonable,
court pointed out that it sought to impose on copyright
ners restrictions which had no reasonable relation to the pub-
policy the act was designed to further, that of disclosure
the protection of the public against fraud and imposition
ick v. *Gibbs,* U.S.C.C.N. Fla. Aug. 5).

Evidence.—Where the search for evidence was illegal, the evi-
ce is inadmissible (*United States* v. *Thompson,* 113 F. [2nd]
, C.C.A. 7th). Parties to a contract cannot alter rules of
dence precluding judicial inquiry into the facts (*Shultz* v.
erican Nat. Ins. Co., 142 S.W. [2nd] 275). Blood test to
ermine intoxication, being taken without the subject's consent
one having no authority, was held inadmissible as illegally
ained evidence (*State* v. *Weltha,* 292 N.W. 148 [Iowa]).
ephone records may not be admitted into evidence if there
an interception unauthorized by the sender (*United States* v.
akoff, et al., 112 F. [2nd] 888 [C.C.A. 2nd]).

Labour.—The National Labor Relations board vastly enhanced
jurisdiction through the doctrine of integration, that is, if
part of a company's operations affect interstate commerce,
any other part of the same business may be subject to the Wagner act (*Virginia Electric & Power company* v. *NLRB,* 115 F. [2nd] 414, C.C.A. 4th). In *Montgomery Ward and Co., Inc.,* v. *NLRB* (C.C.A. 8th, Dec. 2), the court held that a system of surveillance of employees, although initiated by the employer for purely legitimate purposes, may become unlawful when utilized for the additional purpose of securing information regarding union organizations and intimidating union members. In another case (*The Press Co.* v. *NLRB,* Ct. of App., D.C., Dec. 9) it was held that there was no authority under the Wagner act to outlaw employer surveillance of employees in and of itself, even if union activities are covered by it. The court, however, did support the Labor board because it found the information was secured as a basis for discriminating against union members. In short, the test of whether such surveillance or labour espionage will be permitted is the use made of such findings.

Among the rights of labour determined are: (1) *Freedom of Speech.* The circuit court held that "the constitutional right of free speech is just as clearly a right of employers as of employees" and that "the employer has the right to have and express a preference for one union over another so long as that expression is the mere expression of opinion in the exercise of free speech and is not the use of economic power to coerce, compel or buy the support of the employees for or against a particular labour organization." (*Continental Box Co.* v. *NLRB,* 113 F. [2nd] 93, C.C.A. 5, June 27); (2) *Right to Organize.* The circuit court of appeals in New Orleans held that the law flatly prohibits the formation of employees' associations which though "ostensibly independent" are in fact really "influenced, though ever so slightly, by the management." Such an association of employees, the court ruled, may not be recognized as representing the employees under the Labor act (*NLRB* v. *Lane Cotton Mills Co.,* 108 F. [2nd] 568, C.C.A. 5th). The circuit court of appeals in San Francisco, on the other hand, decided that employees have vital "civil rights" freely to organize themselves if they so desire into "inside" associations; that it is as much the duty of the Labor board to protect such an association as it is to destroy an employer-dominated union (*NLRB* v. *Sterling Electric Motors, Inc.,* 114 F. [2nd] 738); (3) *Right to Picket.* As anti-picketing ordinances mounted in number, courts have manifested a distinct trend toward invalidating them as unconstitutional curbs on the inviolate right of assembly and free speech. An appellate court in California (*California* v. *Garcia*) and the supreme courts of Nevada (*City of Reno* v. *Second Judicial District court,* LRR 671) and Oregon (*American Federation of Labor* v. *Bain,* LRR 563) invalidated anti-picketing ordinances. These courts rely upon the United States supreme court's decision in *Hague* v. *C.I.O.* reiterating the constitutional guarantee to the right of assembly and freedom of speech. The Michigan supreme court has been the latest to join the ranks in declaring peaceful picketing to be lawful (*Book Tower Garage, Inc.* v. *Local No. 415, International Union, United Automobile Workers of America,* Dec. 10); (4) *The Right to Counterproposal.* Under this doctrine an "illusory" counterproposal may likewise be charged a refusal to bargain collectively. Where, however, the employer's refusal to offer counterproposals is indicated by insubstantial evidence, his refusal will not be deemed lacking in good faith (*Easton Publishing Co.,* 19 NLRB No. 43); (5) *Reinstatement and Back Pay.* Employers were required to reinstate union employees with back pay, even though the only reason for the discharge was that all other employees, members of a rival union, struck against working with them, and the employer's only alternative was discontinuing operations entirely (*Cape Cod Trawling Corp.,* 23 NLRB No. 18). Under the ruling of the circuit court

ROBERT H. JACKSON was nominated U.S. attorney-general Jan. 4, 1940, to succeed Frank Murphy

of appeals in Boston, the Labor board was supported in its order for "back pay" and "instatement" for disappointed applicants for employment who were discriminated against because of their union activities. (*NLRB* v. *Waumbec Mills,* 114 F. [2nd] 226, C.C.A. 1st.) A contrary view was taken by the New York Circuit Court of Appeals in *NLRB* v. *Yale & Towne Mfg. Co.* (114 F. [2nd] 376, C.C.A. 2nd). In *Hamilton Brown Shoe Co.* (E.D. Mo., May 6) a federal district court held that the Labor board may make no claim for back pay in a bankruptcy proceeding on the theory that it was a provable debt based on an implied contract owing to the government for the benefit of the employees. The court ruled that the board's power to order affirmative action is limited to orders against going concerns; (6) *Elections and Representation.* In *Easton Publishing Co.* (19 NLRB No. 43) the Labor board ruled that employees hired to replace strikers are barred from a collective bargaining election even though the strike was not caused by any unfair labour practice by the employer and was more than ten months old; (7) *Agreements in Writing.* An employer may not refuse to embody an agreement with the union in writing merely because of his desire to continue certain practices on a voluntary basis (*in re Singer Mfg. Co.,* NLRB No. C-1336, June 6).

Among the practices declared unfair were: (1) Refusal to recognize a certified union as exclusive bargaining agent of employees after a rival union claimed that it represented the majority of employees (*Valley Mould Iron Corp.* v. *NLRB,* C.C.A. 7th, Dec. 17); (2) Speeches and notices that union membership was not required for continued employment (*in re Blue Bell-Globe Manufacturing Co.,* 24 NLRB No. 3). The dissemination of anti-union propaganda was held not to "interfere with, restrain or coerce employees" (*NLRB* v. *Ford Motor Co.,* 114 F. [2nd] 905, C.C.A. 6th).

Social Security.—A person filling positions of general manager and sales manager, with authority in both capacities to hire and discharge, who received no salary but was paid separate commissions on volume of sales and selling price, paying salesmen therefrom, is not an employee. (*Beaverdale Memorial Park, Inc.* v. *Danaher,* Conn. Sup. Ct. Err., Aug. 14.)

Solicitor of orders on a commission basis, who sells trade-ins and accessories on his own account and also does repair work in connection with sales activities is an employee under Oregon Unemployment Compensation law, although working from home at his convenience and paying all expenses. (*Singer Sewing Machine Co.* v. *State Unemployment Compensation Comm.,* Ore. Sup. Ct., June 25.)

A purported partnership agreement between employer (c ducting painting and decorating business) and painters, which the effect of employer receiving profits and standing losses business in certain maximum amount and other "partners" ceiving payment for work actually performed, does not dest employer-employee relationship (within meaning of New Y unemployment insurance law) (*in re Scott,* N.Y. App. Div., Dept., Oct. 31).

Taxation.—A municipality may properly expend funds to tract a new industry under a charter authorizing the city to pend for general welfare (*City of Fernandina* v. *State,* 197 454 [Fla.]). A shareholder's income from an insurance policy the president of the corporation was held taxable as divider (*Golden* v. *Commission of Internal Revenue,* 113 F. [2nd] [C.C.A. 3rd]). Trust income, even though made available b beneficiary, was held taxable to the settlor if he retained a ri to that income (*Helvering* v. *Mercantile-Commerce Bank & Tr Co., et al.,* 111 F. [2nd] 224 [C.C.A. 8th]). A Wisconsin stat taxing the declaration of dividends, held invalid by the state co (*J. C. Penney Co.* v. *Wisconsin Tax Comm.,* 298 N.W. [Wis.], was declared constitutional by the United States supre court [Jan. 1941]). The state of Pennsylvania could tax a r dent's equitable interest in personal property even though t property was located in another state (*Commonwealth* v. *Stew* Pa. Sup. Ct., March 25).

Trade Regulation.—The Federal Trade commission's role trade regulation has been a large and varied one, charged as is with the enforcement of the Robinson-Patman act and Federal Trade Commission act. From the numerous rulings a decisions we select a few broadly indicative of the manner which the commission is policing industry.

Robinson-Patman Act.—The Robinson-Patman act conden the receipt of commissions by a brokerage firm which controls buyer or is controlled by the buyer, if the transaction is in int state commerce. A seller cannot pay brokerage to persons w in fact act for and represent the buyer in making the purcha The fact that the brokerage firm renders services to the sell is immaterial (*Webb-Crawford Co.* v. *Federal Trade Commissi* 109 F. [2nd] 268, cert. den.; *Great A. & P.* v. *F.T.C.,* 106 [2nd] 666, cert. den.).

Unfair Competition.—In the few cases decided by the co the Federal Trade commission was upheld in its rulings in Rob son-Patman cases. It enjoyed similar successes in the field unfair competition. In its significant case against Fashion Or nators Guild of America, the Federal Trade commission orde that the trade association of dress manufacturers cease and sist from its efforts to suppress style piracy. The 2nd Circ Court of Appeals, upholding the commission, read into the gu "a combination seeking to exclude outsiders from a market which they have as lawful access as it has itself." The fact t the guild sought to remedy an evil practice did not change character of the boycott.

Fair Trade.—With the establishment of the constitutiona of the Fair Trade laws in 1936, efforts have been made to circu vent the rigid controls of such resale price maintenance. In case a retailer sought to sell such products at less than minim resale price fixed in contracts made under the New Jersey F Trade act. New Jersey chancery court decided that the mark ing of such a combination package constituted an abandonm of the fair trade contract and denied an injunction to the ma facturer restraining the retailer from selling such products less than minimum resale price (*Bathasweet Corp.* v. *Weissb Bros.,* N.J. Chanc. Ct., Oct. 2).

Loss Leader Laws.—Loss Leader laws have not fared as well their companion, the Fair Trade laws. One such illustration

Wisconsin Unfair Practices act which limited localities to h the act could be made applicable. This discrimination was unced by the court as an improper classification of counties, s and towns by population, a differentiation which the court was not warranted by the objectives of the act and hence unconstitutional (*State of Wisconsin v. Nevau,* Wis. Sup. Nov. 20).

n the other hand, the provisions of the Connecticut statute h prohibited wholesalers and retailers from selling, offering ll and advertising for sale merchandise at less than cost was ld, the court ruling that the act was not a penal statute nor it a price fixing law (*Carroll v. Schwartz,* Conn. Sup. Ct. Aug. 7).

ne provisions of the California Unfair Practices act have been applicable to sales to the federal government. (*Metropolitan rict Material Dealers' Assn.* v. *Eastside Bldg. Materials Co.,* Calif. Super. Ct., Los Angeles City, Aug. 26.) (*See* also KRUPTCY; SUPREME COURT OF THE UNITED STATES.)

(B. WE.)

vn Tennis: *see* TENNIS.

d. The nine chief lead-producing countries, with outputs in excess of 50,000 tons, supply nearly 90% of the world , the remaining 10% being scattered among a large number inor producers, only five of which, France, Italy, Poland, United Kingdom and Japan, produce amounts in excess of 00 tons. World production declined 33% from 1929 to 1932, in 1939 had recovered to 98% of the former high; the 1939 increased by 1%, to 1,722,700 tons, while preliminary esti- s for 1940 indicated some increase.

nited States smelter production increased 9% in 1940, to 00 metric tons, but the refinery output, which includes scrap veries, made a better showing, the total for the first 11 ths being 475,000 tons, or 5% more than for the whole of

World Production of Lead
(In thousands of metric tons)

	1929	1932	1937	1938	1939
stralia	177.3	189.2	234.4	235.7	252.4
gium	62.2	61.5	88.0	90.5	96.0
nada	148.0	116.1	186.4	185.7	177.9
rmany	97.9	95.2	162.4	171.7	181.4
rma	81.5	72.3	78.9	81.4	78.6
xico	248.8	130.3	231.2	242.7	215.7
in	133.3	109.8	30.0	36.0	27.0
S.S.R.	6.2	18.7	55.0	69.0	75.0
ited States	624.2	251.7	426.3	344.4	381.4
World Total	1,756.8	1,179.7	1,719.6	1,704.2	1,722.7
Ex. U.S.	1,132.6	928.0	1,293.3	1,359.8	1,341.3

. Shipments to consumers at the end of November were 500 tons, 7% over the figure for the same period in 1939. he end of July, Mexico was 10% behind 1939. No 1940 rts were available from other producers.

rough the occupation of France, Belgium and Poland, Ger- y secured control of some 160,000 tons of smelting capacity, since most of this was operated on imported ores, it resulted ttle relief to the German shortage, beyond such stocks as on hand in the plants. Great Britain was even more de- lent on imports than Germany, and while no sources of ly were lost, access to the remote empire sources (Australia, ada and Burma) was made more difficult. (G. A. RO.)

gue of Nations. The work of the League of Nations, an organization concerned with the lopment of co-operation and the improvement of relations een states, was bound to suffer by the temporary ascendancy he league's antithesis—war, a state of enmity and disunity. But the league was making one big contribution to the future—it was keeping alive a centre of international collaboration and sanity, where men's efforts are co-operative.

Up till the collapse of France, many of the league's organizations at Geneva were able to carry on important work in spite of depleted staffs and budget. For example, the league co-ordinated the nonmilitary assistance of many governments to Finland, in her resistance to Russian aggression. The value attached to this may be gathered from the earnest appeal of Finland to the league for its continuance and increase after her surrender. The health organization carried on. The Singapore bureau worked as efficiently as ever, to the advantage of all, belligerent or neutral. Turkey was given essential serums when a series of earthquakes menaced the health of thousands.

League experts kept on helping China to fight against diseases caused by the war, especially in the northwest provinces. At Geneva research work was published on social and medical plans for the transfer of large populations, and more was in hand regarding nutrition.

The various league committees dealing with the control of the drug problem held their normal sessions, with the support of the big majority of civilized states. It was vital to keep the machinery of control in being, for war increases the menace of illicit traffic. This was already a major danger in the far east, where the Japanese military authorities would seem to have encouraged drug addiction to destroy the stamina of the Chinese. Above all, initial steps were taken, at the Hague and Geneva, to create a new committee (arising out of the 1939 Bruce report) to guide and control all the nonpolitical work of the league. It was to be the aim of this committee, on which states not members of the league will sit, to apply the results of scientific study to the problems of human life and social security. The remarkable work of the International Labour organization (*q.v.*) was encouraged by the warm support of all the American states.

But with the overrunning of the neutral states by Germany, and the sudden surrender of France, this record of work was abruptly checked. Switzerland became an island in a sea of totalitarian or pro-totalitarian states. Communications with the world were precarious. War made effective membership of the league by the Scandinavian states, the Baltic provinces, Belgium and France a question mark. German occupation closed the Hague Court of International Justice in the middle of its work. No sessions of the council of the assembly, or of the larger committees, could be held at Geneva. If the league machinery was to be kept in being, large-scale changes had clearly to be made. In July 1940, the secretary-general, M. Avenol, sent in his resignation, and in September his place was temporarily filled by the deputy secretary-general, Sean Lester, who had won a big reputation as league commissioner at Danzig, under almost impossible conditions. Decentralization began. A portion of the league's work might go on at Geneva; but at least two of its most creative and dynamic bodies, the International Labour organization and the Economic and Financial committee, found a home across the Atlantic. McGill university, Montreal, housed the former, and Princeton university, U.S.A., the latter. Here, with welcome American and Canadian assistance, programs of research work on vital problems arising out of the war and likely to arise out of postwar reconstruction, were under way.

The catastrophes of 1940 inevitably affected league finance. When meetings of assembly or council became impossible the supervisory commission, whose normal business is finance, was invested with wide general powers. It managed to meet at Lisbon in September.

New factors had to be taken into account. In the Palais des Nations, the secretariat, under Sean Lester who had succeeded

M. Avenol, still operated with a staff of about 100 as compared to over 600 in peacetime. All departments and services still worked, if only in skeleton.

And war had made many of the league's problems, economics, finance, health, child welfare, the drug traffic, refugees, more important than ever. In addition the economic and financial department by the autumn had a new operating centre at Princeton, N.J.

The supervisory commission stressed the wide scope there still was for the league in technical, social and humanitarian activities, but in view of the facts decided to halve the normal league budget. War and enemy occupation had made the situation of several countries uncertain. Temporary suspension of contributions accordingly was sanctioned for Albania, Belgium, Denmark, Estonia, Latvia, Lithuania, Luxembourg, Norway and Poland. The contributions of China, Finland, France and Holland were halved. The league thus could, it was expected, count on an income of about £500,000, of which one-third goes to the International Labour organization. In case of unforeseen events the reserves established by previous wise financing could be drawn on. But prompt, regular payment by league members was, the commission reported, the best way in which to support the league. Finance was the key to the future. (*See* MANDATES; PACIFISM; REFUGEES.) (M. FE.)

"Lease-Lend" Bill (H. R. 1776): *see* DEFENCE, NATIONAL; INTERNATIONAL LAW.

Leather. An advisory organization enumerated, with reference particularly to the leather industry of the United States, eight objectives as most worthy of research. These were the devising of more rapid tannages for heavy leathers, the development of leather dyeing formulas capable of a more uniform and exact reproduction of colours, a chemical or process that would eliminate iron from solutions of tanning materials, a means to prevent discolouration of leather on exposure to light, improvement in the washability of leather gloves, a material to combat greasy spew that affects certain types of leather, a satisfactory process for tannage of white leather and measures to increase the weight, or heft, of leather.

Concerning the foregoing subject, British research workers reported a white leather made with formaldehyde without preparatory tannage with another material. The leather is full and has a strong grain. It is washable with soap and water and does not become tender upon storage, as was found to be true with former formaldehyde tannages.

It was recommended that cleaners for white shoe leathers should be fortified with lubricating oils. Sulphonated coco-nut oil was proposed with the suggestion that a small bottle of it be furnished with each pair of shoes, with instructions for its application after every ten cleanings.

The removal of chromium from chrome-tanned leather, a treatment applied frequently to scrap leather in making glue, can be done in a variety of ways. Among the acid dechroming agents, the organic acids are more effective than the inorganic. Salts of these acids whose negative ions are good penetrating agents likewise dechrome. Alkaline and alkaline-oxidizing agents, such as borax, sodium bicarbonate, sodium hydroxide, triethanolamine and sodium perborate, also exert a pronounced dechroming action.

To promote research in the production of leathers of greater resistance to atmospheric decay, a standardized gas chamber for accelerated ageing was developed. The unique feature of this apparatus is that the pollution of the atmosphere within it is produced and controlled through the burning of a fuel comprising methyl alcohol containing known concentrates of *n*-amyl sulphite.

Experimental work indicated that the retanning of vegeta tanned leather with alum imparts to the leather exceptiona sistance to acid rot. Use of alum salts appeared to possess s advantages over the similar use of chromium compounds s alum does not produce the bluish to greenish undertones c resulting from chrome.

Appreciable attention was given to the production of a pig leather of sufficient durability, resistance to tearing and pliab to serve for shoe uppers. Promising developments in this di tion were attributed primarily to a new method of removing grease from the skins, necessary before they can be tanned.

Estimated Number of Staple Hides and Skins Tanned
(000's omitted)

	1929	1936	1937	1938	1939	19
WORLD						
Cattle hides	101,614	105,223	104,874	101,515	103,142	100,
Calf and kipskins	74,650	75,012	74,166	72,995	74,545	71,
Goat and kidskins	87,664	80,122	83,557	78,863	80,276	75,
Sheep and lambskins	96,211	90,729	90,913	88,067	90,887	84,
UNITED STATES						
Cattle hides	19,146	22,628	22,875	19,410	22,100	21,
Calf and kipskins	15,364	13,127	12,440	12,500	14,050	11,
Goat and kidskins	55,686	47,150	46,600	32,783	40,890	38,
Sheep and lambskins	38,985	37,942	34,235	28,950	39,400	36,
GERMANY						
Cattle hides	9,116	9,610	9,817	9,750	9,814	9,
Calf and kipskins	10,317	12,436	13,006	12,187	11,116	9,
Goat and kidskins	8,512	7,527	8,313	6,450	7,987	5,
Sheep and lambskins	10,004	10,608	10,411	9,865	8,955	7,
UNITED KINGDOM						
Cattle hides	10,612	11,063	11,413	10,960	10,787	11,
Calf and kipskins	7,319	6,918	7,617	7,800	8,144	7,
Goat and kidskins	8,516	12,613	13,005	13,195	12,610	10,
Sheep and lambskins	9,115	7,967	8,012	8,610	8,855	7,
FRANCE						
Cattle hides	9,007	6,159	7,248	7,500	7,880	6,
Calf and kipskins	7,689	7,005	7,512	7,895	8,055	7,
Goat and kidskins	11,992	7,165	7,341	8,210	9,177	6,
Sheep and lambskins	12,055	10,815	11,417	11,612	12,545	9,

War activity resulted in marked changes in world produc and international trade in leather during 1940. Many of the portant European leather producing centres were partially or tirely destroyed, while others were invaded and their raw ma als and finished products removed as spoils of war. The ou of leather in Europe was believed to have been considerably al normal in the first half of 1940 but to have declined sha in the following six months as a result of war activity.

In virtually all countries engaged in fighting and in mos the others where military preparedness was in full sway, t were efforts to increase or maintain production of heavy leat even at the expense of reduced output of the light varie Where domestic supplies of suitable hides were not suffic and foreign stocks could not be obtained readily, the use of h leathers was restricted generally to the armed or defence fo and in all of the countries at war there were regulations gov ing the use of leather.

Because of the increased demand for military leather in s countries and the difficulty of obtaining sufficient supplies civilian use, mainly in Germany and Italy, authorities in t areas fostered the production of suitable substitutes. With use of genuine leather restricted by regulations, consumers fo it necessary to use the substitutes and producers benefited f the opportunity of accomplishing considerable research for proved products at minimum costs. Many different type leather substitutes were developed in Europe since the middl 1939 and new materials continued to appear on the market r larly.

One of the important aftereffects of the war of 1914–18 was development of tanning industries in many countries that p ously obtained almost all their requirements from foreign sou Such areas were forced to develop domestic tanning indus

ause war conditions did not enable them to import the desired ntities and varieties of leather.

'he indications were that the war of 1939 would result in the ing of a much wider range of leathers in many countries the same reasons. The fact that so many of the important opean tanning centres suffered from the effects of this war would not be in a position to operate again for many years oured this opinion. (R. W. F.; J. G. Sc.)

anon: *see* FRENCH COLONIAL EMPIRE.

ward Islands: *see* WEST INDIES, BRITISH.

gislation. **Federal.**—Events abroad vividly pointed out the necessity for preparedness. In response to the at of war congress enacted legislation designed to enlist man er, industry and wealth.

elective Training and Service Act.—See SELECTIVE SERVICE.

oldiers' and Sailors' Civil Relief Act: National Guard Act.— Soldiers' and Sailors' Civil Relief act of 1940 was passed protect the economic position of the conscript by certain atory provisions, suspending the enforcement of civil liabili- in certain cases to enable persons engaged in the military ice of the United States to devote their entire time to the nce and needs of the nation. The most important provisions designed to mitigate the economic hardships due to loss of . Re-employment provisions require that the conscript re- e a guaranty that his job will be restored to him with repara- for any loss caused by the employer's unlawful refusal to re him on his return. The statute does not, however, require mployment where it is "impossible or unreasonable." Thus example, reinstatement would hardly be obligatory in the of necessary reduction in employment or discontinuance he business.

'he benefits of insurance shall apply to any person in military ice who is the holder of a policy of life insurance, when holder shall apply for such benefits on a form prepared in ordance with regulations which shall be prescribed by the ninistrator of Veterans' Affairs. The benefits of this act shall be available to any person in military service in respect of contracts of insurance in force under their terms up to but not exceeding a face value of $5,000, irrespective of the number of policies held by such person whether in one or more companies, when such contracts were made and a premium was paid thereon before the date of approval of this act or not less than 30 days before entry into the military service. In no event, however, shall the provisions of this article apply to any policy on which premiums are due and unpaid for a period of more than one year at the time when application for the benefits of this article is made or in respect of any policy on which there is outstanding a policy loan or other indebtedness equal to or greater than 50% of the cash surrender value of the policy.

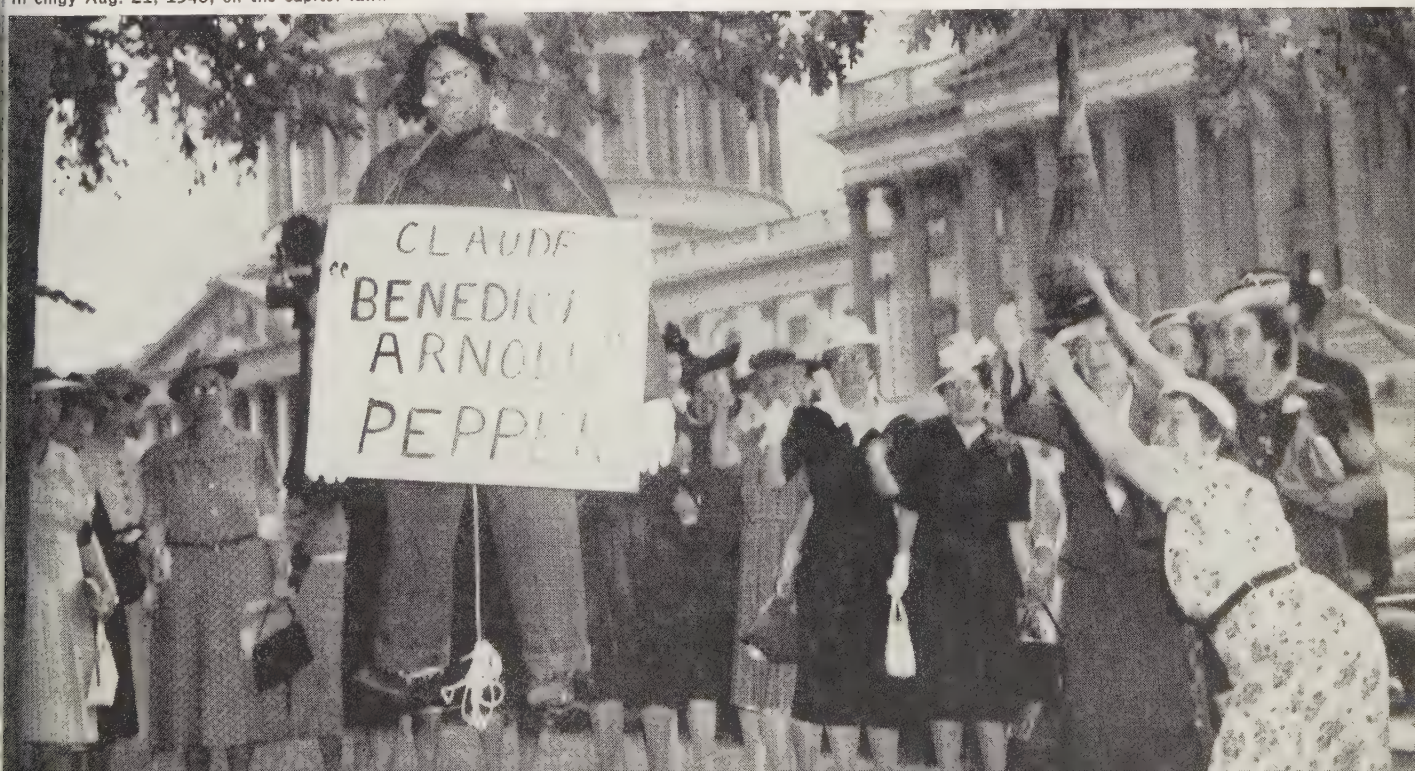
The provisions of this section shall apply when any taxes or assessments, whether general or special, falling due during the period of military service in respect to real property owned and occupied for dwelling, agricultural, or business purposes by a person in military service, or his dependents at the commencement of his period of military service and still so occupied by his dependents or employees, are not paid.

Nationality Act.—This act codifies all the laws of the United States dealing with citizenship, nationalization and expatriation and amends many of the previous laws concerning national defence and subversive activities.

Persons who served honourably in the army, navy or marine corps or coast guard for an aggregate of three years are relieved from complying with the five-year period of residence, declaration of intention, certificate of arrival and residence within the jurisdiction of the naturalization court.

For the commission of any act of treason, the penalty is loss of citizenship, but only after conviction by a court martial or a court of competent jurisdiction. Citizenship may also be lost by obtaining naturalization in a foreign state, taking an oath of allegiance to a foreign state, serving in a foreign military force when such service may only be rendered by its nationals, or voting in a foreign political election. Citizenship may further be lost by a naturalized citizen who resided for two years in a foreign state, of which he was a national, or where he was born, if he acquired, through such residence, the foreign nationality, or for three years otherwise. In the case of other foreign coun-

HIS SUPPORT of the U.S. draft bill, Sen. Claude Pepper of Florida drew the wrath of a group of women anticonscriptionists who proceeded to hang in effigy Aug. 21, 1940, on the capitol lawn



tries, expatriation would result from a residence of five years.

National Defence: Sabotage.—The act of April 20, 1918 (40 Stats. 533) provides a penalty of $10,000 fine or imprisonment for 30 years, or both, for wilful injury to or destruction of war materials, war premises or war utilities, whenever the United States is at war. Three new sections are added to the statute which provide a penalty of $10,000 fine or 10 years' imprisonment, or both, for attempt at or wilful injury to or destruction of premises, facilities, materials used for national defence purposes, and which are defined as "national defence" materials, premises and utilities in language similar to that used in the 1918 act to define war materials, premises, etc. The penalties provided also apply to any attempt to make up national defence procurement orders—tools, machines, etc.—in a defective manner.

The amendments provide penalties for acts of sabotage in connection with national defence while the nation is not at war, the original act of 1918 providing only wartime penalties. The definition of the United States is to include the Philippines as well as the Panama Canal Zone.

Industrial Mobilization.—In view of the emergency, congress authorized the mobilization of U.S. industry into a pre-war economy. This was ordered to expedite and co-ordinate the procurement of contracts and to establish methods of vesting the government with priority control and the power to commandeer manufacturing facilities and order the expansion of production facilities.

Excess Profits Tax (Second Revenue Act of 1940).—The excess profits tax, according to its sponsors, was enacted principally from a desire to prevent profiteering. It is imposed on net income in excess of a certain sum which is called, in the language of tax laws, "the excess profits credit." It is applicable only to corporations or such organizations as may be classified as associations taxable as corporations; only to corporations whose "excess profits net income" for the taxable year, placed on an annual basis, exceeds $5,000; to corporations whether engaged in defence work or not.

The act increased the tax on normal income of corporations earning net profits of more than $25,000 a year from 19%, as provided in the Revenue act of 1940, to 24%. (Both the 1939 rate of 18% and the 1940 rate of 19% have thus been superseded before going into effect.)

It imposed the following additional graduated rates on "excess profits" on all corporations not specifically exempted:

On excess profits not exceeding $20,000	25%
On the next $30,000	30%
On the next $50,000	35%
On the next $150,000	40%
On the next $250,000	45%
On all over $500,000	50%

It defines excess profits according to two formulas, of which the taxpaying corporation may take its choice:

(a) *Average earnings.* All profits in excess of 95% of the average earnings for the base period 1936 through 1939, inclusive, not more than one deficit year to be counted as zero in computing the average earnings of the base period.

(b) *Invested capital.* All profits in excess of 8% of the taxable invested capital, including all "equity" capital and 50% of "borrowed" capital.

Except for corporations which have resulted from certain types of mergers and consolidations, the average income method may be elected only by those corporations which were in existence before Jan. 1, 1940 and which make the election in their returns.

All corporations subject to the tax are allowed initial excess profits of $5,000, to be exempted from the levy. Corporations with normal net incomes of $25,000 or less are permitted to carry over the unused portion of the excess credit for a period of one year, provided the income during the second year does not exceed $25,000. Parent corporations owning 95% of all cla of stock of affiliates (except non-voting preferred) are allowe file consolidated returns. The commissioner of internal reve is given authority to make necessary adjustments of abnorm ties relating to income or capital. Corporations building plant facilities, certified by proper governmental authorities necessary for national defence, are permitted to amortize total cost of such facilities out of tax-free earnings ove period of five years, provided such facilities are completed a June 10, 1940. The taxpayer may elect either method in termining his "excess-profits credit." Once having made election, however, he is bound and cannot subsequently ad the other method for that tax year.

Failure to file a return when one should have been filed the opinion of the treasury department, subjects the delinq taxpayer to a 25% penalty and deprives it of the full advant of the statute of limitations. Filing an incomplete return equivalent of failure to file.

Alien Registration Act.—Some of the provisions of this neither restricted to aliens nor involving the mere formality registration, make unlawful influences designed to obtain overthrow of any government in the United States by force violence, or "in any manner cause insubordination, disloya mutiny, or refusal of duty" by a member of the armed for

Of the various factors indicating whether particular influen are to be classified as undesirable, foreign origin has been corded increasing weight. Reliance has been placed mainly three sources of proving the origin of influences:

1. Taking orders or advice from foreign principal.
2. Accepting gratuities or compensation from foreign principal.
3. Membership limitation in organizations.

Revenue Act of 1940.—The principal provisions of the Reve act of 1940, approved June 25, are as follows:

Personal exemptions were lowered from $1,000 to $800 single persons and from $2,500 to $2,000 for married pers The 4% normal tax on individuals was not changed, but su rates have been increased in all the brackets from $6,000 $100,000. Rates on the bracket from $4,000 to $6,000 and on brackets in excess of $100,000 are unchanged.

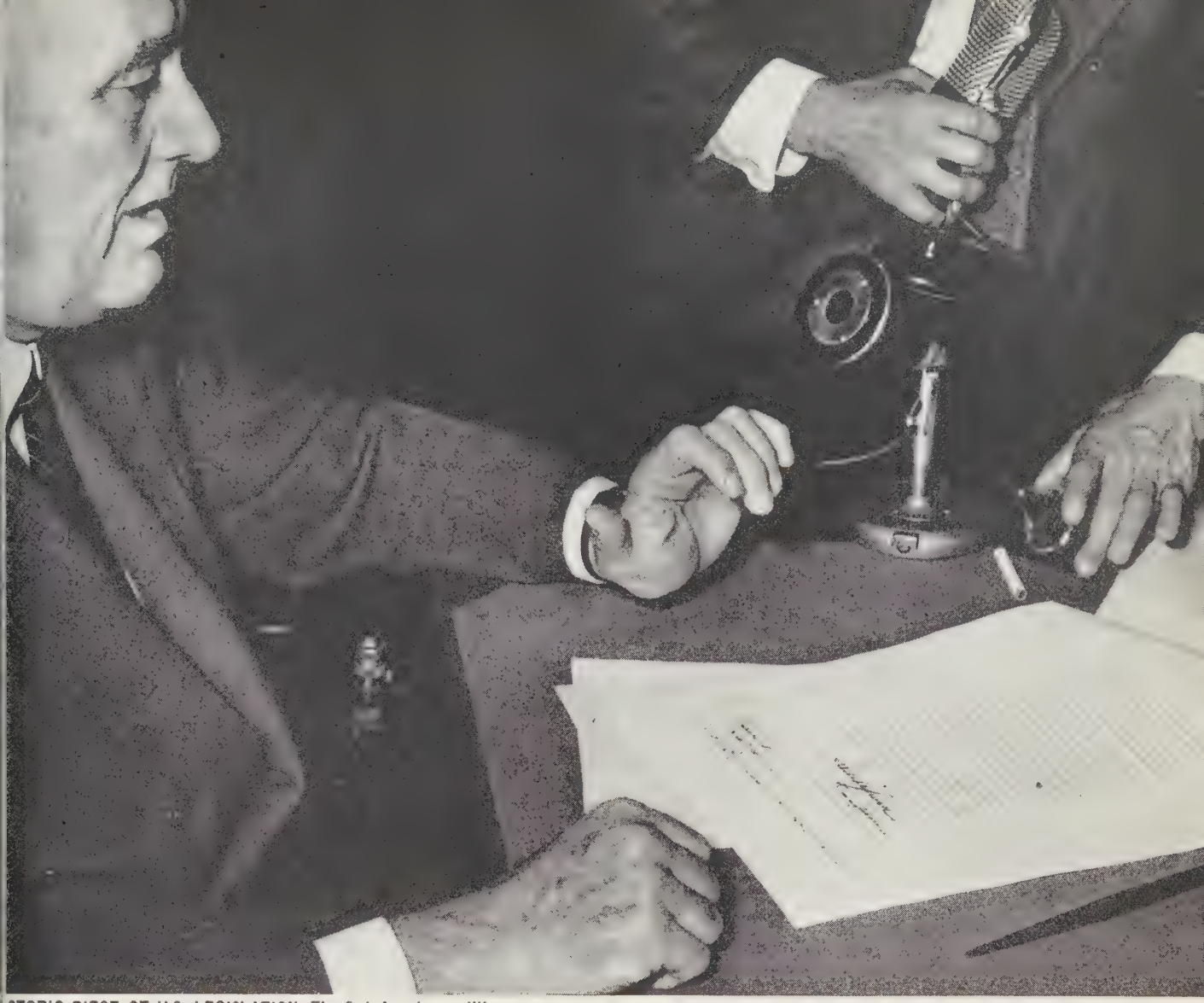
In addition to the above changes, which are permanent in cl acter, a defence tax amounting to 10% of the income tax is posed for the next five years. There is a limitation upon supertax. It is provided that "in no case shall the effect of section be to increase the tax computed without regard to section by more than 10% of the amount by which the net come exceeds such tax." For example, if the permanent inc tax amounted to 60% of the net income, the supertax would 4% of income (that is, 10% of the amount by which the income exceeded the tax) instead of 6% of income (which the amount that 10% of the tax would equal).

Returns must be filed by single persons with a gross income $800 or over, and married persons with a gross income of $2, or over.

The changes in rates provided for in the Revenue act of 1 will not go into effect as these rates have been superseded the 1940 act. The 18% general rate on corporations with inco of more than $25,000 has been increased to 19%. Upon sma incomes the normal tax rates are as follows:

Net incomes not in excess of $5,000—13½%
More than $5,000 and not more than $20,000—15%
More than $20,000—17%

A defence tax of 10% of the tax computed at the above is superimposed on the normal tax. A 10% defence superta also applicable to the surtax on improper accumulations, and



STORIC PIECE OF U.S. LEGISLATION. The first American military con- tion in peacetime came into effect Sept. 16, 1940, as President Roosevelt d the Burke-Wadsworth Selective Service bill

ax on personal holding companies.

ivestment Company Act.—The Investment Company act of) was passed to cure alleged abuses existing in investment panies, among them: (1) Removal of funds from control of e who supply them, (2) conflicting interests of management, pyramiding, (4) excessive management charges and hidden , and (5) management's use of control. The sponsors, or nizers, of investment companies and investment trusts usually ined management in their own hands and constituted a group insiders" who had obtained control of the fund.

urther provision delimiting the control of management and vision for a degree of control by the investing public is made ection 15. Subdivision (a) states that investment advisers t be under a contract approved by a majority vote of the hold- of voting securities. Further, this contract must clearly e the compensation, but be for only a two-year period, may be renewed with the annual approval of a majority of such rity holders, must be terminable on 60-day notice by the d of directors or by a majority of the shareholders, and must matically terminate on assignment. Section 15(b) requires contracts with principal underwriters be for a maximum of years, be non-assignable and renewable only by the annual roval of the board of directors or a majority of the security lers, and subdivision (c) requires the approval by a majority he disinterested directors or stockholders of any contract with an investment adviser or principal underwriter.

The act contains certain provisions aimed to meet the abuses of "excessive charges for management" and "hidden fees." Section 18(d) prohibits the issue of purchase warrants except ratably to a class of shareholders, and provides that they must expire after four months; section 22(b) prohibits the sale of redeemable securities to an underwriter or dealer at a discount except in accordance with certain rules; and section 22(c) gives the commission power to prevent or remedy exorbitant sales loads.

Other safeguards contained in the legislation are: section 12, prohibition of margin purchases, authority to Securities and Exchange commission to regulate short sales and dealing in and distribution of own securities; section 19, requirement of disclosure of sources of dividends and prohibition of dividends unless there would remain certain prescribed asset coverage for the remaining securities; section 32, requirement of financial statement certified by a public accountant chosen or approved by the security holders.

The Securities and Exchange commission is empowered to issue rules and regulations and to enforce certain penalties for noncompliance. Provision is also made for appeal to the United States circuit court of appeals from such orders and findings of the commission.

Transportation Act.—The text of this act alters many provisions of the present Interstate Commerce act while adding a new part III to regulate water carriers. It is the most important piece of transportation legislation enacted since the passage of

the Transportation act of 1920. The act is set up in three titles. Title I—Amendments to existing law, covers various changes in part I, the railroad part of the Interstate Commerce act, and in part II, the Motor Carrier act; Title II—Regulation of Water Carriers in Interstate and Foreign Commerce, is the Interstate Commerce act's new part III; and Title III—Miscellaneous, covers such matters as the investigation of various modes of transportation, conditional repeal of land-grant rates, and the liberalizing amendments to the Reconstruction Finance corporation's railroad-loan provisions.

Section 1, paragraph 14, is rewritten to increase the ICC's power with respect to equipment rentals paid by the railroads. It will hereafter be able to inquire into arrangements for the use of privately owned rolling stock; *i.e.*, "whether or not owned by another carrier." Also, it becomes unlawful for any railroad or express company to enter any contract for the furnishing of protective service against heat or cold, or to continue, after April 1, 1941, as a party to any such existing contract unless the arrangements have been approved by the commission. The commission is authorized to extend the aforementioned April 1, 1941 deadline until Oct. 1, 1941. A new paragraph makes it unlawful to bribe any railroad employee with intent to influence his action with respect to the distribution or movement of cars; while paragraph 18 is amended by adding a new sentence to stipulate that railroads may without commission approval enter contracts with each other "for the joint ownership or joint use of spur, industrial, team, switching, or side tracks." A new paragraph provides "that shippers of wheat, cotton and all other farm commodities for export shall be granted export rates on the same principles as are applicable in the case of rates on industrial products for export"; and the commission is directed "on its own initiative or on application by interested persons, to make such investigations and conduct such hearings, and, after appropriate proceedings, to issue such orders as may be necessary to carry out such policy." Still another provision gives the commission the task of investigation of inter-territorial freight rates. The act makes the beneficial owner liable for freight charges on reconsigned or diverted shipments which are refused or abandoned at ultimate destination. If, however, the reconsignor or diverter has given erroneous information as to the beneficial owner, such reconsignor or diverter is made liable for the charges. It relieves a consignor of liability for charges on collect shipments wherein carriers have failed to carry out instructions to deliver to another party only upon payment of all transportation charges. It further eliminates the equidistant clause and makes remaining provisions—the long-and-short-haul clause and the aggregate-of-intermediates provision—applicable to water carriers as well as to railroads.

Section 5, which covers pooling, unifications, mergers and acquisitions of control, is rewritten to make it applicable to all carriers subject to the act. The commission employs minimum as well as maximum powers over all rates subject to the act. The commission may prescribe through routes and joint rates without reference to the short-hauling of any carrier—if it finds such routes "necessary to provide adequate, more efficient, or more economic transportation." However, "reasonable preference" must be given to the railroad which originates the traffic; and no through route can be established for the purpose of assisting any carrier to meet its financial needs.

State.—Among the states that met in ordinary and extraordinary session, the following were selected, and a brief review of a few of the more important laws passed by them is set forth below:

Economic Legislation.—Kentucky enacted a Fair Trade law for distilled spirits and wine, providing for a fair trade contract with minimum resale prices from resident producers, processors and vintners to wholesalers; from wholesalers and importers to retailers; from non-resident producers, processors and vintners on brands sold in this state to wholesalers and importers. It also established an Aeronautic commission in the interest of public safety and aeronautic progress, and regulated operations of rural electric co-operative associations organized under the laws of contiguous states through a corporation subject to the supervision of the Public Service commission of Kentucky. Louisiana enacted an Unfair Sales act banning sales below cost; also an act regulating securities dealings throughout the state. In New York discrimination by labour organizations was prohibited under penalty of not less than $100 nor more than $500 to be recovered by the person aggrieved. For a period of one year a corporation may contribute for betterment of social and economic conditions in any community. But no funds paid by a public utility company subject to the jurisdiction of the department of public service for any such purpose shall be deemed a part of the expense of operation of the business of the corporation and chargeable as such. The Fair Trade act, protecting trade mark owners, distributors and the public against uneconomic practices in distribution, was amended so that the law does not apply to or fix or limit prices at which any commodity may be sold or offered for sale to the state of New York or any administrative department of the state government, to any political subdivision of the state, any municipality, public corporation or authority created by the legislature, to any college, university or public library, or department of education. It banned untrue and misleading advertising of merchandise, real estate, securities, services, whether through circular, newspaper, magazine or radio; also, omitting to label drugs or labelling them wrongly will make the offender guilty of misdemeanour. Virginia enacted a law to encourage the co-operative marketing of farm products; authorized the incorporation of industrial loan associations for the purpose of making small loans to industrial classes on security and at low rate of interest; prohibited fraud or unfairness in the sale or disposition of securities; amended its Unfair Sales act; provided for regulation of the produce market authorities and regulated outdoor advertising outside of corporate limits of cities and towns in sight of public highways.

Social Legislation.—Kentucky passed a law requiring all applicants for a marriage license to be examined for venereal disease. Another law required that every physician and surgeon or other person, legally permitted to engage in attendance upon a married woman, shall take a blood specimen for serological test for syphilis from such woman as soon as he is engaged to attend the woman and has reasonable grounds for suspecting that pregnancy exists. In New Jersey the division of old age assistance was continued; also, no benefit rights accruing to any individual prior to or after such individual's induction into a branch of the military or naval service, or any organization affiliated therewith of the United States or of New Jersey, shall be prejudiced by reason of the induction into such service for the duration of such service.

Whenever 50% or more persons employed by a board of education shall indicate in writing their desire to participate in any hospital service plan or group insurance plan, or both, and such board of education, by majority vote of the entire board approve such participation, proper disbursing officers of the board are empowered to deduct specified fees or premiums from the payment of their salaries. These constitute voluntary payments by the employee. In another statute child labour was regulated so that no minor under 16 may work in a factory. He may, however, engage in agricultural pursuits, although not before 7.00 A.M. or after 6.00 P.M. (if 16–18 not before 6.00 A.M. or after 10 P.M.). Combined hours of work and at school of children under

must not exceed a total of eight hours per day.

n New York a law ordering the support of a stepchild by per- s legally chargeable therewith up to the age of 17 was passed. also enacted legislation declaring that whoever prints, pub- es or circulates, or causes to be printed, published or cir- ated any advertisement in pamphlet, card, handbill or spaper notice to advise on laws of any foreign state, nation or sdiction for the purpose of procuring or aiding in procuring divorce, annulment or offering to appear or act as attorney counsel in suit for alimony, divorce or annulment of any mar- e in the state or elsewhere is guilty of a misdemeanour. ough another measure it declared that no claim for medical or gical treatment will be valid and enforceable as against an em- er, unless within 48 hr. notice was furnished by the physician ng the treatment, to the employer and the Industrial com- sion on forms prescribed by the industrial commissioner.

Iospitalization services by licensed physicians and surgeons er the supervision of the State Corporation commission are norized in Virginia. Anyone wilfully and maliciously tamper- with or tapping telegraph or telephone wires in Wisconsin uilty of a misdemeanour and is punishable by a fine of not than $50 nor more than $500 or imprisonment not exceeding year or both. This state also provided for determining pre- ing rates of wages and establishing legal work day and legal k week on public works contracts.

axation.—Mississippi and Kentucky enacted chain store taxes erned after the Louisiana type (*i.e.*, determined by the total ber of stores—wherever located in the chain). The rates ap- able to Kentucky stores range from $25 to $200, and to sissippi stores from $10 to $300; the maximum rates in both s apply when there are more than 350 stores in the chain. Mississippi act grants a concession in reducing the rate by -fifths for stores in cities with less than 3,000 population by one-fifth for cities having 3,000 to 6,000 population. ssachusetts also imposed a tax on the privilege of operating e or more stores or mercantile establishments. The rates ap- able range from $10 to $300, with maximum rate applying to or more stores.

iquid fuel used for propelling vehicles over the highways not coming within the terms of existing definitions of tax- motor fuel was made taxable by Alabama, Louisiana, South olina and Virginia at 6, 7, 6 and 6 cents respectively. New ey allows a refund for gasoline consumed in vessels used usively for Sea Scout training. New York continued the two rgency gasoline taxes of 1 cent each for another year. A sissippi act provided for exemption of certain street-paving erials, added certain definitions, regulated handling of gaso- for export, etc. Virginia required all motor carriers to chase within Virginia, motor fuel in amount to that necessary their operation in Virginia. The Virginia tax applicable to line purchases in Virginia for use in aircraft in intra- e commerce, was extended to apply to interstate commerce well.

he District of Columbia amended its act to exclude from s income all payments of benefits made to or on account of a eficiary under veterans' legislation.

entucky provided that dividends must include distributions of current and accumulated earnings or profits, that stock ributions were not considered as dividends, but they were to reated as gain from securities when the shareholders secure fferent interest in the corporation.

he Louisiana income tax rate range lowered the several kets so that the maximum rate will apply on income (in ex- of credits) over $8,000 instead of over $5,000. It also pro- d for a tax of 5% on the net income in excess of $5,000 derived from the sale or lease of certain unimproved lands, mineral rights, leases, etc.; deleted a provision which required exclusion from gross income of interest received upon obligations of the United States, and excepted from exclusion from gross income interest paid on amounts paid by reason of the death of the insured under a life insurance policy; set up a "percentage of premium paid" method of determining the income tax cost of annuities, and declared that the basis for property converted from personal use to use for profit shall be the fair market value at the time of conversion.

Mississippi prescribed a schedule ranging from 3% to 8% (the maximum applying on all over $10,000) in lieu of a 3% to 6½% graduation (the maximum applying on all over $15,000). The act also brought all corporation dividends within the taxable list. A credit for taxes paid on income from sources outside the state was provided for, which further prescribed, however, that if the tax paid in the other state exceeds the amount that would be due in Mississippi, only the latter amount will be allowed as a credit.

New York continued its emergency 1% tax on personal income, and also the tax on unincorporated business. Returns in New York no longer will be required to be made out under oath, but the statute provided that penalties shall accrue for failure to certify, instead of to verify, any return. Another New York act provided for joint returns by husband and wife providing that the income of each, even though one had no gross income or capital gain, may be included in a single return made by them jointly, in which case the tax shall be computed on the aggregate income, and the liability with respect to the tax shall be joint and several; it also provides that a name signed to a filed return shall be prima facie evidence that the return was signed by such individual.

The 3% to 5% South Carolina intangibles tax on income from dividends and interest was repealed. The repeal, however, was made not effective until after the tax for the calendar year 1940 had been collected. Federal employees were brought within the terms of the state income tax laws in Louisiana, Mississippi and Virginia.

California sales tax exempted sales of livestock, poultry, newspapers and publications. These exemptions also apply to the use tax.

Louisiana repealed its general sales tax. New York city continued its retail sales tax and gross receipts tax, and adopted a use tax.

Numerous amendments were made in New York by the first two laws; one that should be noted is the provision exempting sales of fuel oil, ships' stores, etc., for ships not operated within the limits of the city.

Kansas City, Mo., imposed a municipal use tax as complementary to the state sales tax. (B. We.)

Leland Stanford Junior University: *see* STANFORD UNIVERSITY.

Lemons and Limes. The 1940 crops of lemons and limes in the United States were, as reported by the department of agriculture: lemons, all produced in California, 13,430,000 boxes; limes, all produced in Florida, 80,000 boxes. The 1939 production of lemons was 11,963,000 boxes (about 76 lb. net to the box) and the ten-year (1929–38) average was 8,233,000 boxes. The 1939 crop of limes was 95,000 boxes and the ten-year average 28,000 boxes. The Australian crop of lemons in 1940 was 300,000 boxes, about 77% of the 1939 crop and about 75% of the average. The Mexican lime crop in 1940 was reported about 20% less than the record crop of 897,000

boxes in 1939. The table shows United States imports of fresh limes from different countries in the 1939–40, the 1938–39 and in the five-year (1931–35) average of seasons.

U.S. Imports of Fresh Limes from Certain Countries

	1939–40 Boxes	1938–39 Boxes	1931–35 Boxes
Mexico	110,362	104,930	75,691
Dominica, B. W. I.	7,614	6,239	11,718
Jamaica, B. W. I.	3,354	3,462	5,694
Cuba	2,107	1,370	644
Trinidad	0	363	1,345
St. Lucia, B. W. I.	885	1,252	8,079
Dominican Republic	96	567	499
Honduras	28	4,329	193
Haiti	27	0	119
Others	27	37	2,857

The Trinidad and Tobago Lime association asked the government in 1940 to establish compulsory co-operative marketing of lime oil in order to protect the quality of shipments to the United States, which in 1939 imported 134,000 lb. of lime oil.

(S. O. R.)

Leopold III (1901–), king of Belgium, born Nov. 3, was the son of King Albert I, whom he succeeded Feb. 17, 1934. He was married Nov. 10, 1926 to Princess Astrid of Sweden, who was killed in a motor car accident in 1935. At the first onslaught of the German invasion May 10, 1940 Leopold assumed command of his armies, issued a proclamation to his people and appealed to France and Britain for aid. His unconditional surrender of May 28 caused a storm of indignation among sympathizers with the Allied cause throughout the world, and many of his own subjects branded him as a traitor. The Belgian rump parliament controlled by Premier Hubert Pierlot formally voted to depose him and continue the struggle against the nazis. But later authenticated reports absolved Leopold of treasonous action. One of his staunchest defenders was U.S. Ambassador Cudahy, who declared that the surrender was completely justified. On Dec. 5 the Belgian-American Educational foundation, of which Herbert Hoover is chairman, published a booklet entitled *The Belgian Campaign and the Surrender of the Belgian Army* which branded as false the charge that Leopold had not notified France and Britain of his intention to capitulate. On July 1 Leopold was reported to be under German custody at Laeken castle, Brussels.

Leprosy. A knowledge of the current incidence of leprosy is so essential to an understanding of the problem created by its presence that records and estimates of its prevalence are continued from year to year. Thus, in the British Isles 78 cases have been observed during the past 30 years. Among those upon which information was obtained there were four which developed apparently within the islands while the remainder originated abroad. Thirty-two of the cases have been seen recently, among which five were under hospital supervision. In Nigeria the number of lepers is estimated at 400,000 among a total population of 24,000,000. In the year 1938 there were 104,000 on record and an estimated number of 170,000 among a population of approximately 50,000,000 scattered through the French overseas territories, though in the province of M'Bomon of French Equatorial Africa it is believed that 9% of the 145,000 population is affected. The provisional incidence recorded in different sections of Brazil ranges from 0·2 to 2·5 cases per 1,000 population, with a total number of 35,241 of which 10,545 are in São Paulo. In Argentina there are about 4,500 cases recorded of which approximately 84% are in the littoral areas of the eastern provinces.

Further observations were made of the great frequency with which leprosy has developed among children born in the Leprosaria of Colombia; and studies of the history of a few cases North America and of their family connections in Canada and United States have led one author to conclude that heredit factors play a major role in the propagation of leprosy.

An investigation of the basal metabolic rate (physiological change of energy) among 318 leprous individuals revealed t 75·4% of them were within the range of normal rates and variations were without correlation between the types or sta of the disease. The appearance and course of leprous manifes tions within the skin has given rise to a nomenclature which cludes the designations simple leprids, tuberculids, tubercul changes, reactive phase (leprous fever) and the presence of or another of these manifestations has been variously int preted as representative of a special form of leprosy, and reflection of the resistance of the tissues to infection. Inves gators have concluded from the microscopic structure of th changes in the skin that simple leprids are characterized by co monplace chronic inflammation in which the leprosy bacilli concentrated mainly in the small peripheral twigs of the nerv also that the existence of gradual transition forms between type of lesion and another is evidence against the concept th tuberculoid leprosy is a special form of the disease; and t tissue changes which occur in tuberculoid leprosy and in t reactive phase are expressions of allergy (an exaggerated s ceptibility, or response of the tissues to the presence of the bacillus the products of its degeneration) similar to that which occurs in the cou of other diseases. It has also been concluded that the reaction induced tuberculoid leprosy by the injection of Leprolin is an expression of all and that this test is therefore specific for leprosy. However, it is to be no that these interpretations are not universally accepted.

The frequency with which various organs of the body may be affec by leprous processes is indicated in a review of 1,200 protocols of necrops performed on leprous persons. The liver was involved in 811 instances, spleen in 754, the adrenals in 640, the testis in 582, and the cranial bo in 39. The causes of death of the individuals examined were attributed tuberculosis in 38% of the number and to diseases of the kidneys in 20

Research leading to the detection or diagnosis of leprosy proceeded c tinuously, and it was reported that a confirmatory test was accomplish by injecting an alcoholic extract of the fresh urine of leprous patients i the skin. Fever, and a papule of more than one centimetre diameter s rounded by redness at the site of injection occurred in 199 leprous patie and a smaller papule without redness or fever developed in 91 heal individuals tested.

The general and specific therapeutic value of the administration vitamins through diets and by other methods was receiving comparativ widespread interest. The substitution of whole wheat for rice in the c of a group of East Indian patients during a period of three to four mon was accompanied by some relief from pain in their bones and nerves did not affect the course of the disease. Relief from pain following intra-muscular injection of vitamin B is again reported, and under sim circumstances the value of vitamin C is discounted. The local applicat of ointments in which the content of vitamin A is naturally or artificia great is believed to have been specifically conducive to the healing leprous ulcers.

Among the therapeutic drugs it was found that the intra-dermal adm istration of histamine is more effective than recognized analgesics in reli ing painful complications. Modern compounds of antimony and arse such as Fuadin and Soluseptasine are considered of value in treat leprous fever and ulcers; and degeneration of bacilli in the skin and trogression of the lesions of 50 patients in Thailand (Siam) has b attributed to the injection of diphtheria toxoid (detoxified toxin).

The possibility that toxic principles in some plants used as food m contribute to the development of leprosy was tested by feeding monk colocasia for periods of two or more months, and by supplementing feeding in some instances by injections of sapotoxin. Subsequent inocu tion of these animals with leprous material was followed by the devel ment of leprosy-like nodules at the site of inoculation, bacilli in the e and nasal secretions, marked changes in pigmentation of the skin thickening of areas of the face and of other parts of the body, includ the nerves.

Renewed efforts to reproduce leprosy in the lower animals were made one instance by the inoculation of rabbits with cultures of bacteria obtai from leprous material; and in other experiments by introducing lepr material into chickens. Some animals developed leprosy-like nodules un the conditions of each set of experiments.

Further observations were made on the similarities in the comparat pathology of leprosy and the leprosy-like disease of rats. Experimen attempts to transmit rat-leprosy from mother to young through the place were made by inoculating the females during pregnancy or before c ception. Acid-fast bacilli were reported in the tissues of a few of the yo which were separated from the inoculated mothers some time after bi Among inoculated rats fed diets which were deficient in vitamin B_1 c tent the incubation period of the disease was shorter and it exhibite greater tendency to disseminate through the internal organs. Under conditions and criteria of these experiments an interrelation also appea

e active between dietary deficiency in vitamin B1 and calcium salts.

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ttuce. The area sown to lettuce in the United States in 1940 was reported by the department of agriculture 162,010 acres compared to 171,420 acres in 1939 and a ten-r (1929–38) average of 156,840 acres. Five crops of lettuce grown commercially in the United States. The table shows

ettuce Acreage, Production, Yield and Prices, 1940, 1939 and 1929–38

Crop	Commercial acreage			Yield per acre, crates		
	1940	1939	1929–38	1940	1939	1929–38
rly . . .	41,150	37,000	44,140	173	180	116
ond early	52,040	70,150	49,400	133	107	110
ermediate	4,340	4,130	4,850	225	194	195
te (1) . .	28,580	27,590	26,060	145	153	139
te (2) . .	35,900	32,550	32,390	..	151	136
	Production, crates			Average price per crate		
	1940	1939	1929–38	1940	1939	1929–38
rly . . .	7,113,000	6,670,000	5,136,000	$1.29	$1.43	$1.48
ond early	6,922,000	7,485,000	5,438,000	1.82	1.31	1.71
ermediate	975,000	801,000	948,000	1.80	0.77	0.90
te (1) . .	4,139,000	4,210,000	3,622,000	..	1.33	1.35
te (2) . .	..	4,904,000	4,392,000	..	1.68	1.46

acreage, yield, production and average prices of these five ps in 1940, in 1939 and in the ten-year average as reported by department of agriculture. (S. O. R.)

vene, Phoebus Aaron (Theodore) (1869–1940), U.S. biochem- was born in Sagor, Russia, Feb. 25, and was graduated from Imperial Military Medical academy in St. Petersburg in 1891. went to the United States in 1892 and continued his studies Columbia university while practising his profession. In 1896 became associate in chemistry in the Pathological Institute of w York, and in 1905 he joined the staff of the Rockefeller titute, serving until 1939 when he retired. He was a member chemical societies in Europe and the United States as well as American Philosophical society and the National Academy of ences, and was the author of many papers on technical phases his specialty. He died in New York city, Sept. 6.

ewis, Francis Park (1855–1940), U.S. ophthalmologist, was born in Hamilton, Canada, May , and was graduated from the New York Ophthalmic hospital 1877 and later studied in London, Berlin and Vienna. He began actice in Buffalo in 1876. For many years he was head of the w York State School for the Blind at Batavia. He received a d medal in 1928 for his work in the prevention of blindness d the same year he founded the International Association for Prevention of Blindness. He died in Brookhaven, N.Y., Sept.

Liberia, an independent Negro republic on the west coast of Africa, bounded N.W. by Sierra Leone and in the hinterland and E. by French West Africa. Area, *c.* 46,000 sq.mi.; pop. (est. Dec. 31, 1937), 2,500,000. Chief town: Monrovia (cap., 9,700). President: Edwin Barclay; language, official: English; religion: Christian (Protestant).

History.—The constitution of this independent West African state is modelled on that of the United States, which, however, owing to Liberia's faulty administration, was not able to accord its government recognition until 1935. Traffic in slaves is entirely abolished; the "Human Leopard" and other native secret societies have been brought definitely under government control; but, though increasing attention is being paid to health and education, complete absence of railways and inefficiency of such roads as exist act as a brake on progress. A main arterial road was in course of construction in 1940; since 1938 selected students from the high school have been sent to the Achimota agricultural college for training; and the proposal of United States Senator Bilbo for the voluntary colonization of Negroes has, for the time, remained in abeyance. The chief products are rubber and palm kernels; large deposits of iron and other ores are known to exist, but they have not been worked.

Banking and Finance.—In 1938: revenue, $1,247,626; expenditure, $983,887; public debt (Aug. 31, 1938), $1,943,793. Currency: Liberian dollar, exchangeable at a fixed rate of $4.80=£1 sterling.

Trade and Communication.—Overseas trade, 1938: imports, $2,241,792; exports, $1,990,255. Communications, 1938: roads suitable for motor traffic, *c.* 150 mi.; shipping cleared, 1,761,715 tons.

Agriculture and Mineral Production.—In 1938 (export figures) (in metric tons): rubber, latex, 1,457; rubber, crepe, 1,456; piassava, 5,008; coffee, 892; cocoa, 549; palm kernels, 462,682 bushels; gold, 1,902 troy oz.; ivory, 9,147 lb.; palm oil, 162,757 imperial gallons.

Libraries. During 1940 libraries gave a good deal of attention to the part they can take in the preparation for national defence, and also to the effect of the emergency upon their normal service. In 1917–19 the American Library association collected and spent more than $5,000,000 for library war service both in the United States and abroad. That experience proved the need for books in the military establishments, not only for recreation and general vocational education, but for military training. Since then the army and navy have maintained library service on a reduced scale. Camp libraries will be established by the war department at government expense under the supervision of the morale division of the adjutant general's office. The present library organization in the navy, directed by the bureau of navigation, will be expanded with the increase of ships and personnel.

The resources of research libraries in the fields of science, technology and economics are likewise of importance. Late in the year the preliminary edition of a *Guide to Library Facilities for National Defense* was published. This was the work of the joint committee on library research facilities for national defence, of which R. B. Downs is chairman, in co-operation with the various libraries represented in the survey. Another obligation of libraries is to provide books that will help in understanding the grave problems confronting the world, and in preserving democratic government and intellectual freedom. (*See* "The Librarian and the Democratic Process," by Archibald MacLeish, in A.L.A. *Bulletin,* June 1940.)

A meeting of representatives of publishers and libraries was held in New York on Jan. 29 to discuss the proposal of certain pub-

lishers to restrict library discounts to a maximum of 25%. This would seriously affect library book purchases. As a result of the meeting the president of the A.L.A. appointed a special committee whose first step was to work for amendment to state fair trade acts which would exempt libraries from their operation. In April the Field-Crawford act (New York) was so amended. (See *Library Journal*, Feb. 15, 1940, p. 149.) Efforts were being made to obtain books and periodicals needed for research from continental Europe. Shipments from Great Britain, although irregular, were coming through safely. Some libraries want foreign publications as promptly as war conditions permit; others, preferring safety and completeness of periodical files, arranged that their orders be stored abroad until they can be shipped with less risk.

The Harrison-Thomas education bill, which includes provision for federal aid for libraries, did not come up for action by congress as was hoped. Whether or not it could be introduced in 1941 was uncertain. A new copyright bill (S. 3043), drafted by the committee for the study of copyright, was introduced by Senator Thomas (Utah) on Jan. 8, read twice and referred to the committee on patents. Under the new bill, which represents a great advance over present legislation, copyright will exist on creation, and will be for the term of life and 50 years.

In the spring the librarian of congress appointed a committee of librarians, consisting of Dr. Carleton B. Joeckel (chairman), Paul North Rice and Dr. Andrew D. Osborn, to examine and report upon the organization and methods of those divisions of the library having to do with the acquisition of books and their preparation for use. The Library of Congress on Sept. 1 made the first annual award of five fellowships to young scholars on leave of absence from their universities. The fellows will study the library's collections in their particular fields and will aid in handling difficult reference problems.

Bibliography.—The celebration in 1940 of the 500th anniversary of the invention of printing with movable type was an event of special significance for libraries. With the aid of the Carnegie corporation the printing anniversary committee of the American Institute of Graphic Arts (New York) was organized to give advice and suggestions. Exhibitions were arranged in many libraries in all parts of the United States. In New York, for example, 19 libraries and museums co-operated in preparing a series of co-ordinated exhibitions. The celebration was opened by a special convocation at Columbia university on Jan. 19. The Carnegie corporation granted $35,000 to the Pacific Northwest Library association for the establishment of a bibliographic centre at the University of Washington library in Seattle. Both the Carnegie corporation and the General Education board made grants to colleges in the south and southwest for the purchase of books and for other library purposes. Dr. Albert A. Berg of New York presented a valuable and significant collection of English and American literature in rare editions to the New York Public library in memory of his brother, Dr. Henry W. Berg. The original gift, a collection of nearly 3,500 volumes made by the two brothers, was increased in September by the purchase of the notable collection of 15,000 books and manuscripts from the estate of W. T. H. Howe, for many years president of the American Book company. The special room, designed for the collection and presented by Dr. Berg, was dedicated Oct. 11.

Incunabula in American Libraries; a Second Census of Fifteenth Century Books in the United States, Mexico, and Canada, edited by Margaret Bingham Stillwell, was published by the Bibliographical Society of America in November. The first *Census,* issued in 1919, recorded 13,200 copies; the second *Census* lists 35,247. The Pierpont Morgan library published, late in 1939, a *Check List* of its 15th-century printing containing 1,991 items. A *Short-Title List* of the valuable Chapin library at Williams college, compiled by Lucy Eugenia Osborne, was also issued in 193

BERG MEMORIAL ROOM of the New York Public library, designed for the Be and Howe collections in English and American literature, was dedicated Oct. 1 1940

Library Training and Personnel.—The 1939–40 report of the board of education for librarianship (A.L.A.) lists 30 schools various types accredited by the board as meeting its standard all are connected with teaching institutions. The total enrolmen March 1, 1940, was 2,159, including 228 advanced and 267 sp cial students. On July 1 Professor Rudolf H. Gjelsness succeede Dr. W. W. Bishop as head of the department of library scien at the University of Michigan. There was little change as unemployment among professional librarians; there was perha slight improvement in salaries, but beginning salaries were pro ably lower than they were a few years before. Except for pos tions at the top, experienced librarians over 35 years of age we finding it increasingly difficult to obtain positions, or to chan positions.

Size of Collections or Statistics of Libraries.—Eighteen librari contain more than 1,000,000 volumes each according to th latest available statistics: the Library of Congress, 5,828,1 volumes (June 30, 1939); the New York Public library, 4,256,9 volumes (comprising reference department, 2,758,062 volume circulation department, 1,406,842 volumes; and Municipal Re erence library, 92,000 volumes) (Dec. 31, 1940); Harvard unive sity, 4,159,606 volumes (June 30, 1940); Yale university, ov 2,920,000 volumes (June 30, 1940); Cleveland (Ohio) Publ library, 2,186,908 volumes (Dec. 31, 1939); Chicago (Ill.) Pu lic library, 1,810,520 volumes (Dec. 31, 1939); Boston (Mass Public library, 1,701,166 volumes (1939); Columbia universi (New York city), 1,715,263 volumes (June 30, 1940); L Angeles (Calif.) Public library, 1,601,447 volumes (June 3 1939); University of California, approximately 1,395,151 volum (comprising 1,081,151 volumes at Berkeley and more than 31 000 volumes at Los Angeles) (June 30, 1940); University of Ch cago, 1,300,785 volumes (June 30, 1940); Carnegie library Pittsburgh (Pa.), 1,293,549 volumes (Dec. 31, 1939); Cincinna (Ohio) Public library, 1,258,033 volumes (Dec. 31, 1939); Un versity of Illinois, 1,217,675 volumes (June 30, 1940); Brookly (N.Y.) Public library, 1,161,145 volumes (June 30, 1939 University of Michigan 1,098,197 volumes (June 30, 1940); Un versity of Minnesota, 1,061,965 volumes (1940); Cornell unive sity (Ithaca, N.Y.), 1,063,203 volumes (June 30, 1940).

Such figures are very uncertain standards of compariso because of differences in methods of counting and because publ libraries with many branches contain many copies of new an standard books.

Library Buildings.—Plans for the new central building of th

shington, D.C., Public library, first authorized in 1938, were ing shape. The building, which will form a part of the new nicipal centre, will have its main façade on Pennsylvania ave- opposite the new National (Mellon) Gallery of Art. It will necessary to erect the building in sections, and it was hoped t the first unit would be ready for occupancy in 1942. The t of the entire structure is estimated at not less than $3,500,-. Construction was begun on a new library for Tulane uni- sity, New Orleans, on the Newcomb college section of the npus. The building will cost about $500,000 and will house Howard Memorial collection as well as the university libraries. rvard university began work on a new library for its rare oks and manuscripts. The new building, made possible by support of an anonymous alumnus, adjoins the Widener rary and will have a capacity of 250,000 volumes.

Other buildings completed or dedicated late in 1939 or during o were: Toledo (Ohio) Public library, main building (cost 000,000); University of Alabama, Tuscaloosa (Amelia Gayle rgas library; cost $600,000; capacity 450,000 volumes); Penn- vania State college (cost $500,000); Illinois State Normal uni- sity (Milner library; cost $556,000); Chattanooga (Tenn.) blic-University library (cost $300,000); George Washington versity, Washington, D.C. (gift of Abraham Lister; cost $290,-; capacity 155,000 volumes); Eastern Washington College of ucation, Cheney (cost $286,000; capacity 120,000 volumes); ncord (N.H.) Public library (cost $250,000).

Librarians.—Claribel R. Barnett, for many years librarian of United States Department of Agriculture library in Washing- , D.C., retired Sept. 1. She was succeeded by Ralph R. Shaw, rarian of the Gary (Ind.) Public library. George F. Bower- n, librarian of the Washington, D.C., Public library since 1904, ired Sept. 30. His successor was Clara W. Herbert, a member the library's staff since 1907, and assistant librarian since 20. John Ridington, for 25 years librarian of the University British Columbia, Vancouver, Can., retired Aug. 31. W. Kaye mb, provincial librarian of British Columbia, was appointed the librarianship. Marilla W. Freeman, librarian of the main rary of the Cleveland (Ohio) Public library since 1922, igned July 1.

Arthur A. Houghton, Jr., was appointed curator of the rare ok collection in the Library of Congress on April 1; Alfred D. ator, since 1928 librarian of the Reading (Pa.) Public library, came director of the Pennsylvania State library and museum Harrisburg on July 1. John R. Russell was appointed to the rarianship of the University of Rochester (N.Y.). Caroline L. liott, for many years reference librarian of the Chicago (Ill.) blic library, died on Jan. 14, aged 82. Arthur L. Bailey, rarian of the Wilmington (Del.) Institute Free library since 04, died on Feb. 17. Martin A. Roberts, chief assistant librarian the Library of Congress, died on June 15. His service in the brary of Congress began in the copyright office in 1903; from 23 to 1927 he was chief of the accessions division, and from 27 to 1937 superintendent of the reading rooms. John H. Fin- , editor-in-chief of the *New York Times,* a trustee of the w York Public library and a devoted friend of libraries died March 7. In 1939, at the San Francisco conference, the nerican Library association had elected Dr. Finley to honorary embership in recognition of his services to libraries and adult ucation. (*See* also AMERICAN LIBRARY ASSOCIATION.)

BIBLIOGRAPHY.—For further information about American libraries con- t: *Bulletin* of the American Library association (Chicago); *Library urnal* (New York); *College and Research Libraries* (Chicago); *Library arterly* (Chicago). Important contributions to library literature were: B. Joeckel and Leon Carnovsky, *A Metropolitan Library in Action: A rvey of the Chicago Public Library* (1940); E. W. McDiarmid, Jr., *The brary Survey: Problems and Methods* (1940); Harvie Branscomb, *aching with Books: A Study of College Libraries* (1940); J. K. Wilcox, ed., *Manual on the Use of State Documents* (1940); L. R. Wilson, ed., *Practice of Book Selection* (1940); W. M. Randall, ed., *The Acquisition and Cataloging of Books* (1940). (C. F. McC.)

Great Britain.— The impact of war on British institutions was immense and on libraries no less than on any others. Before three months of war had passed, the service rendered to the community by public libraries throughout the country had come to be regarded by a great many people as one of the necessities of life and as an undoubted blessing at a time when many other forms of community-service and entertainment had been severely restricted if not actually suspended. As the first year wore on and grave news came from the war-fronts followed by all the preparations for the defence of Britain itself and the gradually increasing air-attack, the public libraries rose to the occasion. Encouraged by government announcements that their services were regarded as of national importance, they expanded their activities in such a way that by the closing months of 1940 they had attained a degree of popularity never before reached. A lively appreciation of the part they could play in the national effort led them to extend the service to meet demands from all directions. The supply of books to civil defence units such as Air Raid Precautions and Auxiliary Fire service posts and depots, and to H.M. forces wherever they were placed, were typical forms of extension work. The promotion of study and play-reading circles, listening (radio) groups, gramophone and philatelic clubs were among other forms. In addition they were continually assisting the authorities by special displays concerning such things as food-growing at home, salvage and national savings, and also by developing to a great extent their information service especially to help citizens with their wartime problems of every kind.

War-damage was done to some libraries, notably those of University college, London, and the Inner Temple, and the destruction of valuable books and buildings cannot be minimized. On the other hand new libraries were opened in many places including Edinburgh, Leeds, Sheffield, Huddersfield, Newcastle, Oxford, London and the London suburbs.

Towards the end of 1939 a Service Libraries and Books fund was instituted by the lord mayor of London and this was responsible for the distribution in 1940 of hundreds of thousands of books and magazines to H.M. forces in every theatre of war at home and abroad.

A notable retirement was that of Dr. Arundell Esdaile, from the post of secretary to the British museum. Happily this retirement did not affect Dr. Esdaile's close association with the library world and profession to which, as president of the Library association for the second year in succession, he was devoting much of his time. (D. C. H. J.)

Libya: *see* EUROPEAN WAR; ITALIAN COLONIAL EMPIRE.

Lie, Jonas (1880–1940), U.S. artist, a nephew of Jonas L. E. Lie, Norwegian novelist, was born in Norway, April 29. He was taken to the United States by his parents in 1893 and entered the Ethical Culture school in New York from which he was graduated in 1897. While working as a designer of patterns for printed fabrics in Plainfield, N.J., he studied art at night at the National Academy of Design and the Art Students league in New York. As early as 1903 he had won recognition as an artist of distinction. He became interested in the construction of the Panama canal and painted a series of pictures of the work in progress and completed. Although a member of the American Academy of Design, of which he became president in 1934, he was opposed to the policy of its juries which rejected paintings offered for exhibition by non-members and associated himself with a group of independent artists. He resigned the presidency of the academy on Oct. 19, 1939, because the duties of the office made too many demands on his time. His paintings are in the Louvre in Paris, and in the great art museums of the United States. The King of Norway made him a Knight of the Order of St. Olaf and his fellow artists elected him to many of their organizations.

He died in New York city, Jan. 10.

Liechtenstein, an independent but tiny European State, north-east of Switzerland, to which it is united by a customs union. Area 65 sq.mi.; pop. (est. 1940) 11,500. Chief town, Vaduz (capital, pop. 1,710). Ruler: Prince Franz Joseph II, b. 1906, was given ruling authority by his 84-year old uncle, Prince Franz I, on March 30, 1938 and after the latter's death was crowned prince on May 29, 1939. Language, German; religion, mainly Roman Catholic; products: corn, wine, fruit, wood and marble; revenue (1939) 2,099,300 Swiss francs (nearly $500,000), 31% of which was derived from the sale of postage stamps to collectors all over the world. (S. B. F.)

Life Insurance: *see* INSURANCE, LIFE.
Life Span: *see* BIRTH STATISTICS; DEATH STATISTICS; INFANT MORTALITY; SUICIDE STATISTICS.
Lighthouse Service: *see* COAST GUARD, U.S.
Lighting: *see* ELECTRIC LIGHTING; MOTION PICTURES.

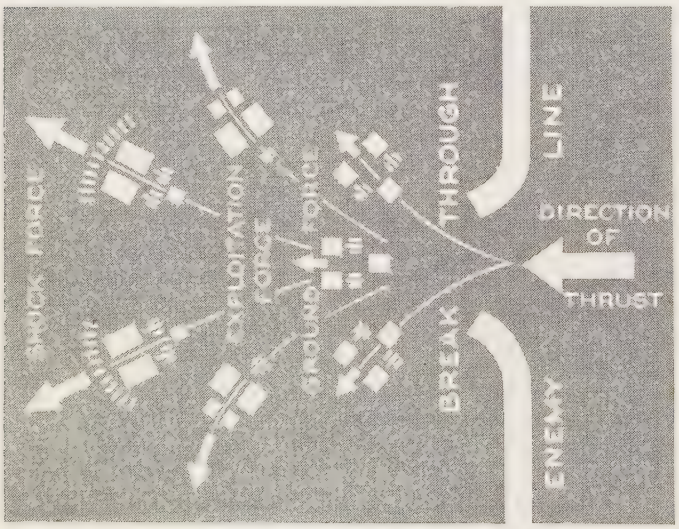
Lightning War (blitzkrieg) is the term used to indicate the technique employed by the German army in the warfare in Europe beginning in 1939. The military principles of surprise, mobility and encirclement seeking the total destruction of an opponent are as old as the profession of arms. However, General Hans von Seeckt, the head of the German reichswehr, during the post-Armistice period, advocated the adoption of a lightning war principle as the only basis for employment of the German forces, in view of the limitations placed on the size of the army by the treaty of Versailles. He claimed that a small army well trained and equipped with modern weapons could defeat a near-by enemy before the opponent could mobilize its maximum strength.

Force of circumstances, therefore, brought about the adoption of the lightning war principle.

Subsequently, the theory was applied to the whole conception of war, including the national attitude and preparedness, as well as the conduct of battle.

The characteristics of lightning war relate first, to the nation as a whole, and secondly, to the conduct of battle. To the nation as a whole, these characteristics are: (a) the creation of a monopoly of power within the state for the purpose of waging intense warfare; (b) the preparatory "war of nerves"; (c) secrecy of preparations; (d) surprise in opening hostilities.

To the conduct of battle these characteristics are: (a) creation of opportunities for the encirclement and destruction of enemy forces; (b) co-ordination of air, mechanized and motorized units with the older ground forces to exploit these opportunities; (c) utilization of speed and range of air and ground motors to concentrate forces for surprise blows of great intensity; (d) utilization of small combat teams operating against weak spots of the enemy defences to extend the battle in depth and to create openings for the advance of speedy mechanized units; (e) secrecy in conception of the battle plan, training of all individuals and units and concealments in the production of new weapons, including combat aviation, the heavy tank and mobile artillery; (f) application of the principles of economy of force, terrain features and the historic role of infantry to assure victory.



A FIRST PRINCIPLE of the German blitzkrieg as practised in 1940 is the rapid break-through of mechanized forces

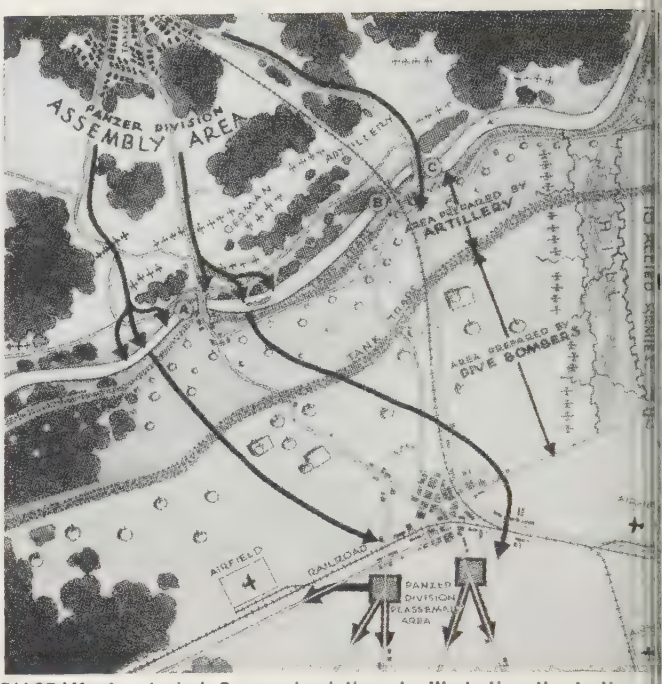


DIAGRAM of a typical German break-through, illustrating the tactics u at Sedan May 13-14, 1940, and showing areas prepared by aircraft and artil before advance of a Panzer (mechanized) division on a railroad junction. A enemy pillboxes have been mopped up, the regular infantry advances and c trenches to hold the area against counterattack

The creation of a monopoly of power within a state for t purpose of waging intense warfare is a prerequisite for the e ployment of the technique of lightning war. All political, soc and economic elements within the state are co-ordinated to g the maximum effort in support of the national war aims.

The preparatory "war of nerves" creates apprehension in t ranks of a potential enemy. False rumours, defeatist propagan encouragement of belligerent minorities, spies and fifth colum ists are allied activities which weaken enemy morale.

Secrecy of preparations for war approximates the appearance peacetime pursuits. Cultivation of large fields strategica located and designed for actual use as wartime airports, dist bution of industrial plants in agricultural areas to gain disp sion of industry, the construction of superhighways and strate railroads, all these, classified as peacetime cultural or soc advantages, are actual preparations for eventual combat.

Surprise applies not only to the national effort but also the conduct of battle. As to the nation, secrecy and surpr are employed to hide the real objectives or the intended o ponent. As to the conduct of battle, secrecy and surprise ma the extent and size of forces engaged and methods to be e ployed in combat.

The creation of opportunities for the encirclement and destr tion of enemy forces depends upon complete success of the p liminary steps leading to hostilities. Between the early and fi battles in the World War of 1914–18, large offensives were i tiated with large-scale artillery preparations followed by t slow movement of the infantry-light artillery mass. The size armies, numbered in millions, the strength of defensive weapo principally the machine-gun and field artillery, and the streng of organized defensive positions resulted in enormous loss These circumstances remained true until the advent of the ta near the close of the war, and further, because aviation had n been developed as aerial artillery support for ground forc Germany employs air, mechanized and motorized forces in cl co-ordination with the older infantry-light artillery forces. arms are designed and used to approximate "mobile weapon

1940, the dive-bomber weakened enemy morale and destroyed ld artillery and ground defences. Parachutists and air in-ntry landed in rear areas to join local sympathizers and hold itical features such as bridges until main forces arrived. The ne interval between the old artillery preparations and the rival of ground forces was eliminated by moving up heavy moured and mechanized units, delivering enormous fire power in pport of motorized infantry. Air forces attacked hostile air its, air-ground installations, reserve locations, supply bases, mmunication lines and civilian centres. Armoured and motor-d infantry with air support exploited gaps to great depth until organization and destruction were complete.

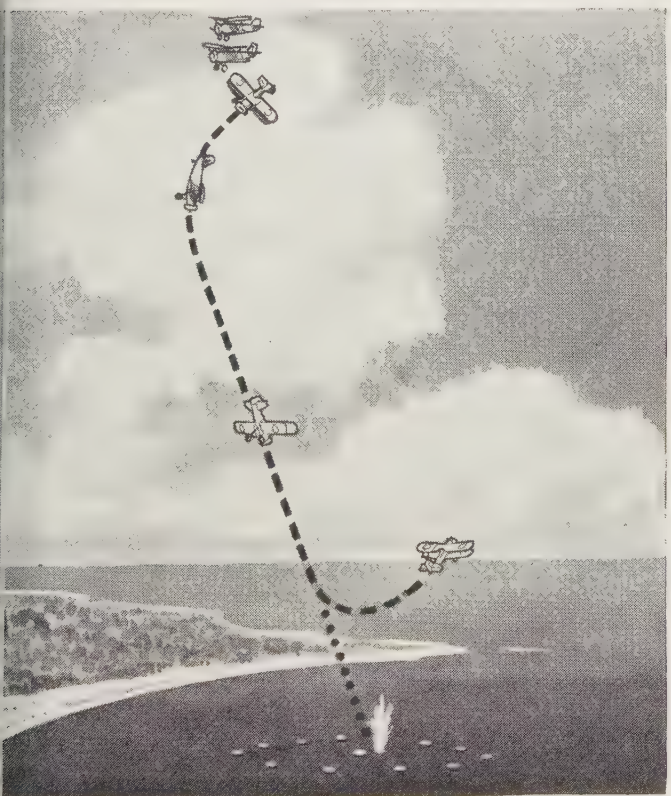
Victory resulted from the speed and range of air and ground tors permitting concentrated forces to launch surprise blows great intensity.

Although small combat teams operated independently of the in body, each supported the principal mission. They were em-yed to create openings for the advance of the speedy mechan-d units. Their success should not be overrated nor considered a decisive factor. They played an important but preliminary le in the final plan calling for use of larger forces.

Combat engineers and mobile supply services up front with ar-oured and mechanized columns is a development essential to the stained action of these weapons. Heavy German columns were, far as practicable, self-sustaining in their composition. Each ntained all essential arms, supplies and aerial support to accom-sh the main mission.

The conception of the battle plan, the training of individuals d units and the production of weapons insured that the enemy uld be unprepared to meet these conditions.

Lightning war emphasizes the principle of economy of force. e maximum effort was delivered with the main force against the incipal objective. Speedy victory was gained with less aggre-te loss of life to both sides. In 1914–18, for a long period, ttle was based upon a policy of attrition-relative losses. Light-



AGRAM illustrating dive-bombing as it is taught to U.S. navy pilots. The ane drops its bombs at 2,500 ft. and levels off before 1,500 ft.

ning war proves that the objective can be gained in a short period. It reintroduces the principles of war of the Napoleonic era applied, of course, with great speed and larger numbers.

From a tactical viewpoint, commanders grasped opportunities created by small independent forces and pushed through large forces which gained great depth and accomplished great destruction. Information in 1940 indicated that just such a situation existed on the French-Belgian border north of Sedan, where the German high command rushed through large mechanized forces which eventually reached the coast along the Somme river.

Outstanding in this lightning war is the historic role of infantry. This arm is charged with the main combat in battle and its action decides the final issue. Its mission is the principal mission of the entire force. Marches of 20 to 25 mi., repeated two and three days in succession exploited opportunities created by shock action of armoured and mechanized air and ground forces.

Blitzkrieg or lightning war has captured the imagination of the world and suggests that some "secret weapon" is responsible for the spectacular successes. There appears to be no "secret weapon" other than the German monopoly of power within the state for the purpose of waging intense warfare and conducting battle by continuous co-ordination of all arms to secure surprise, mobility and the eventual encirclement and destruction of the opponent. (*See* also Air Forces; Armies of the World; European War; Munitions of War; Strategy of the European War; Tactics in the European War.) (H. A. Dr.)

Lime. The popular conception of lime is primarily as a building material, but this is not the case; of the 4,254,000 short tons produced in the United States in 1939, only 24% was used in the building industry, and even in predepression days, when building was much more extensive, the proportion was well under one-half. Agriculture used 9%, and of the remainder 35% went to chemical, 18% to metallurgical and 16% to refractory uses. Of the total sales, about one-third is as hydrated lime and two-thirds quicklime. In Canada production dropped from 674,100 short tons in 1929 to 320,700 tons in 1932, increasing to 550,342 tons in 1939; with a 10% increase in prospect for 1940. (G. A. Ro.)

Limes: *see* Lemons and Limes.
Limestone: *see* Stone.

Lindley, Ernest Hiram (1869–1940), U.S. educator, was born in Paoli, Ind., Oct. 2, was graduated from the University of Indiana in 1893, and became an instructor there the same year. In 1917 he became president of the University of Idaho and in 1920 he was elected chancellor of the University of Kansas, a post he held with a short intermission until he resigned in 1939. He died Aug. 21 on board a steamship on the way from Shanghai to San Francisco.

Linen and Flax. War, in the first five months of 1940, closed to the flax and linen consumers of the world every customary source of supply but the British Isles. As Holland and Belgium followed Scandinavia, Russia, Poland, Latvia, Estonia and Lithuania into closed trade area, the principal world consumers, United States and Great Britain, turned anxiously to plans for finding new fields of production. The British government offered cash bounties of £2 for each acre of grassland plowed up for flax. Canadian producers, with an increase of 100% in 1940 over 1939 in flax acreage, were shipping substantial amounts to Scots and Irish mills, and New Zealand's 1939 production from 100 acres showed gratifying results, including a world record in one section. In ten English counties and in

Northern Ireland and Scotland, small acreages were started for extension of flax cultivation in the local areas. In Peru, the ancient land of the Incas, experimental plantings were under way with efforts by the Peruvian government agricultural school to purchase seed in the United States. In the United States itself, increasing quantities were grown in Oregon and cultivation in Pennsylvania was proposed. In the south, experimentation by engineers at the Georgia School of Technology developed a method of removing wood from flax fibre by machinery and for spinning the fibre on equipment now used in cotton mills, which was expected to enable southern farmers to grow flax at a profit. The research was conducted at the request of the Tennessee Valley authority to provide a new cash crop for the south, alternating with cotton and tobacco.

The potential supply of flax was of immediate concern to military equipment suppliers. Webbings and strappings for parachutes, bomber guns, etc., are customarily made of linen threads because of their superior strength when wet. In the United States, supply officers of both the army and navy were experimenting with materials of other fibres, cotton particularly, to determine whether they would serve in place of linen for all practical purposes.

In civilian use for linens, an interesting situation developed in Ireland. To provide American dollars for purchase of armaments and food supplies, the British government ordered the linen mills to concentrate their civilian linen production on export. The British board of trade reduced the supply of linen goods to domestic retailers to 50% of 1939 quantities. But high prices deterred American buying and resulted in an unprecedented unemployment situation in Ulster. The percentage of unemployed rose from 18·4% in March 1940 to 39·1% in September, with little relief in sight. In October it was reported that merchants and manufacturers were far from satisfied with the board of trade quota for domestic trade and felt that better overseas buying would develop only when prices could be reduced by decreased overhead costs resulting from increased production of home market goods.

A reflection of this situation was seen in the reports of the first eight months' business in 1940 between Northern Ireland and the United States, as reported by *Foreign Commerce Weekly*, issue of Nov. 9, 1940. The value of the linen fabrics exported increased from $3,722,055 in 1939 to $4,408,515 in 1940, but the volume decreased from 3,534,075 lb. to 2,932,975 lb. The average value per pound in 1939 was $1.05 and in 1940 was $1.50. Another indication of the trend away from luxury products is the change in proportion of plain and trimmed handkerchiefs exported. In 1939, 48,701 of the linen handkerchiefs exported were trimmed with embroidery or drawn work. In 1940 this had been reduced to 13,432, although the total export of handkerchiefs had remained fairly constant: 4,608,958 in 1940 against 4,695,904 in 1939. Linen napkins showed a sharp increase in quantity, about one and a half times the 1939 shipments. This last may be an indication that the announced promotion plans of the Irish linen guild, as emphasized at the end of 1939 and beginning of 1940, were showing some results in the U.S. market. The American women may have responded to the suggestion that linen tableware is a more prized possession than the rayon and cotton combinations that were threatening to usurp the more expensive linen product.

Of historical interest is the part played by the Irish linen industry in the manufacture of war materials for Great Britain during 1940. On government work, was 20% to 25% of the linen industry, many working on cotton or cotton and linen mixtures for tent duck, canvas cotton for respirator haversacks, cotton denim to make one-piece service uniforms, and linen dowlas, used for bedding and mattresses. This last also is used for stretchers. Parachute cord and tapes, aeroplane cloth and damasks of various kinds were among the other products. Linen thread for ballo cordage, parachute webbing for gas masks and electrical equ ment employed 1,800 people in one plant alone. Some thre however, substituted hemp for flax, especially in stretcher c vases and awnings. In general, there was one great difference tween the war demands of 1940 and those of 1914–18: In 19 the coarse fabrics were in demand. Before, most of the produ tion was for the fine linen fabric used on aeroplane wings. Toda metal planes at least conserved that much flax. This change fected most of the fine goods mills as represented by the Uls section of the industry, but they were reported to have adapt their equipment satisfactorily to the new requirements.

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(I. L. BL.)

Lions Clubs, International Association of. The International Association of Lions clubs is an association of servi clubs composed of business and professional men, founded Melvin Jones and formed in Chicago, Ill., on June 7, 1917. T 1939–40 international convention was held in Havana, Cuba.

There are approximately 4,000 Lions clubs in the associatio with a total membership of 150,000 in eight countries: Canad China, Colombia, Costa Rica, Cuba, Mexico, Panama, Unit States.

Lions clubs are nonpolitical, nonsectarian. Their purpose is recognize community needs, and meet those needs by independe effort or through co-operation with other agencies. Their acti ities are supervised by club committees, under eight classific tions: boys and girls; citizenship and patriotism; civic improv ments; community betterment; education; health and welfar safety; sight conservation and blind. During the 1939–40 fisc year, Lions clubs reported 50,304 separate activities to their inte national office.

The association's official publication, *The Lion Magazine*, issued monthly. International president for the 1940–41 term Karl M. Sorrick. Headquarters, directed by Secretary-Gener Melvin Jones, are at 332 South Michigan avenue, Chicago, Ill.

(M. Jo.)

Lippincott, Joshua Bertram (1857–1940), U.S. publisher, was born in Huntingdon Valley, Pa., Aug. 24, the son of Joshua B. Lippincot founder of the publishing firm of J. B. Lippincott & Co. He w educated at the Episcopal academy in Philadelphia and the Un versity of Pennsylvania. He left college in 1875 to work for h father, and received training in all the branches of the publishin business. He became vice-president of the company in 1886 a president in 1911, serving in that capacity until 1926 when became chairman of the board of directors. He was a director the American Philosophical society and several Philadelphia institutions. He died in Philadelphia, Jan. 19.

Liquors, Alcoholic. The United States is the country greatest production and consumption potable spirits. Whisky is the predominant beverage. In the fisc year ending June 30, 1940, about 99,000,000 gal. of whisky we produced. The apparent consumption of all whiskies was 114,732 000 gal. Of these 104,189,000 gal. were of domestic origin a 10,543,000 gal. were imported, largely from Scotland and Canad The consumption of gin was 13,130,000 gal.; of rum, 2,430,0 gal. (of which 345,000 gal. were imported) and of brandy 2,450 000 gal., of which 882,000 gal. were imported. Most of th whisky is produced in the United States, next are Scotland, Ca

a and Ireland. Considerable quantities are turned out in ıstralia and a few other countries.

Gin or geneva had its origin in Holland. English gin, which was first a copy of the Dutch product, is known to the trade gener- y as London dry gin. It dominates not only the British but o the general world market. However, the production of gin in United States is far greater than in England.

Brandy, or more specifically "grape" brandy, was recognized for ong time as almost an exclusive product of France. In particu-, the product originating from the Charente district, and which ne is entitled to the designation "cognac," has been considered a standard for this type of beverage. However, a quite fine ality of grape brandy has been produced in California.

World conditions have brought about considerable changes in world supply of alcoholic liquors. Exports of brandy and rdials from France and gin from Holland, have practically ısed. For the time, Britain is maintaining its exports of scotch d gin, at least to the United States. (A. J. Li.)

teracy: *see* Illiteracy.

terary Prizes. Following is a partial list of the awards made in 1940.

nternational.—Nobel Prize: Not awarded.

Jnited States.—American Civil Liberties Union ($50 each in addi- n to royalties): Philo Higley, *First Freedom;* Noel Houston, *According Law.* American Historical Association Prizes: George Louis Beer ize ($240), Richard Heathcote Heindel, *American Impact on Great itain, 1898–1914;* Herbert Baxter Adams Prize ($200), John Shelton rtiss, *Church and State in Russia;* John H. Dunning Prize ($100), chard William Leopold, *Robert Dale Owen.* American Tract Society ize Books: First prize ($1,000), Samuel Marinus Zwemer, *The Glory the Manger;* second prize ($500), Clarence E. N. Macartney, *Christian ith and the Spirit of the Age;* third prize ($250), Wick Broomal, *The ly Spirit.* John Anisfield Award ($1,000): E. Franklin Frazier, *The gro Family in the United States.* Atlantic Novel Prize ($10,000): na Fedorova (Mrs. Antonia Riasanovsky), *The Family.* Carl M. hnenberger Memorial Medal (Southeastern Library association), rry Lee, *Fox in the Cloak.* Bross Fiftieth Anniversary Prize 15,000, Bross fund, Lake Forest university): Harris Franklin Rall, *ristianity.* Commonwealth Club of California Awards to Califor- Authors: Gold medals: John Steinbeck, *Grapes of Wrath,* and Franklin lker, *San Francisco's Literary Frontier.* Silver medals: Agnes Newton ith, *Land Below the Wind;* Robin Lampson, *Death Loses a Pair of ngs;* Donald Culross Peattie, *Flowering Earth;* Mary Virginia Provines, *ight Heritage;* William Saroyan, *The Time of Your Life.* Dial Press ard for Teachers ($1,000): Sophia Belzer Engstrand, *Miss Munday.* ck Street Theatre's (Charleston, S. C.) National Playwriting ard (*c.* $200): Albert Carriere, *Danbury Fair.* Dodd, Mead-Redbook ize Novel ($10,000): Harlow Estes, *Hildreth.* Dodd, Mead Red Badge tective Story: David Keith, *A Matter of Iodine.* Julia Ellsworth rd Foundation Children's Book Contest ($2,000): Lucy Embury, *e Listening Man.* Friends of American Writers' Midwestern Prize 1,000): Elgin Earl Groseclose, *Ararat.* Guggenheim Fellowships (*c.* 400 each): Herman J. Broch, Ward Allison Dorrance, John Dos Passos, yd Frankenberg, Lewis Galantiere, Alfred Kazin, Edwin M. Lanham, drew Nelson Lytle, Delmore Schwartz, Christine Weston, Howard Wolf. ney Howard Award (Playwrights' company): Robert Ardrey. Howells dal for Fiction (American Academy of Arts and Letters): Ellen asgow. Alfred A. Knopf Fellowships ($1,200 each): Wallace M. lly, Wheaton J. Lane, Henry Ladd Smith. League of American iters Fellowships to Exiled Writers ($100 each): Oskar Maria af, Will Schaber, Bodo Uhse. Roi Cooper Megrue Prize ($500, Dram- sts' guild): Howard Lindsay and Russel Crouse, *Clarence Day's Life with ther Made into a Play.* National Book Awards for 1939 (American oksellers association): Elgin Earl Groseclose, *Ararat;* Antoine de Saint upéry, *Wind, Sand and Stars;* Dalton Trumbo, *Johnny Got His Gun;* n Steinbeck, *Grapes of Wrath.* National Institute of Arts and Let- rs Gold Medal: Robert Emmet Sherwood. National Poetry Center dal of Honor: Jessie Belle Rittenhouse, *Moving Tide.* John Newbery dal (most distinguished children's book, American Library association): nes Daugherty, *Daniel Boone.* New York Drama Critics' Award: lliam Saroyan, *The Time of Your Life.* New York Herald Tribune ildren's Spring Book Festival Contest ($250 each): Lucy Herndon ockett, *That Mario,* and James Douglas Adams, *Cap'n Ezra, Privateer.* Henry Memorial Awards (best short stories): first prize ($300), phen Vincent Bénet, *Freedom's a Hard-bought Thing;* second prize 200), Roderick Lull, *Don't Get Me Wrong;* third prize ($100), Edward vill, *The Kill.* Parents' Magazine Medal: Mrs. Sidonie Matsner uenberg, *We, the Parents.* Poetry (magazine) Prizes ($100 each): nnette Sewell Davis, Kenneth Fearing, Robinson Jeffers, Louis MacNeill, riel Rukeyser, David Wolff. Poetry Society of America: medal, draic Colum; first prize ($100), Helen Morrow, *Marcus Aurelius in hemia;* second prize ($50), Harold Vinal, *Impossible Rendezvous.* litzer Prizes ($1,000 in each class): fiction, John Steinbeck, *Grapes of ath;* drama, William Saroyan, *The Time of Your Life;* history, Carl Sandburg, *Abraham Lincoln: the War Years;* biography, Ray Stannard Baker, *Woodrow Wilson: Life and Letters,* vols. vii. and viii.; poetry, Mark van Doren, *Collected Poems.* Society for the Libraries at New York University Gold Medal: Katherine Anne Porter, *Pale Horse, Pale Rider.* Southern Author's Award ($100, Southern Women's National Democratic organization): Hamilton Basso, *Days Before Lent.* Texas Institute of Letters Silver Medal: Dora Neill Raymond, *Captain Lee Hall of Texas.* Yale Series of Younger Poets: Norman Rosten, *Return Again, Traveler.* Young People's Choice Award (Pacific Northwest Library association): Dell J. McCormick, *Paul Bunyan Swings his Axe.*

Great Britain.—A. C. Benson Medals (Royal Society of Literature): Frank Laurence Lucas, Andrew Young. A. E. Memorial Award (£100): Patrick Kavanagh. James Tait Black Memorial Prizes (*c.* £250 in each class): biography, David Charles Douglas, *English Scholars;* fiction, Aldous L. Huxley, *After Many a Summer.* Carnegie Medal (best juvenile book, Library Association of Great Britain): Eleanor Doorly, *Radium Woman.* Hawthornden Prize (£100): James Pope-Hennessey, *London Fabric.*

Canada.—Governor-General's Award: Franklin Davey McDowell, *The Champlain Road.*

Bulgaria.—Bulgarian Ministry of Education: fiction, Fanny Popova-Mutafova, *The Master of Boyana,* and Ivan Karanovsky, *Suntown;* drama, first prize, Kyril Kristov, *The Master and the Devil;* second prize, Nicholas Ikonomov, *Khan Tatar;* third prize, G. Karaivanov, *Winged Horseman;* history and travel, Angel Karaliichev, *The Land of the Bulgarians;* poetry, first prize, Latchezar Stanchev; second prize, Emanuel Dimitrov.

France.—Best Translation of the Year (10,000 fr.): Pierre Francois Caillé, *Autant en Emporte le Vent* (translation of Margaret Mitchell, *Gone With the Wind*). Goncourt Prize: not awarded. Grand Prix Litteraire de l'Empire: François Bonjean. Prix du Roman Populiste: Jean Paul Sartre, *Le Mur.* Prix Femina-Vacaresco: Bertrand de La Salle, *Alfred de Vigny.* Ralph B. Strassburger Prize ($1,000): Max Lambert, *Les Etats Unis Bilan.*

Italy.—Premi Fondazione Fusinato: Riccardo Chiarelli, *Mamma Italia,* and Ettore Fabietti, *Vita Eroica di Antonio Locatelli.* Premi San Remo: Italian authors, Ernesto Caballo, Bruno Fattori, Giampaolo Callegari, Marcello Pilati, Enrico Ribulsi, Cesare Bonacassa; foreign author, Alessandro Marcu. Premio Mussolini of the Corriere Della Sera: Quirino Maiorana.

Portugal.—Camoens Prize (20,000 escudos): John Gibbons, *I Gathered No Moss.*

Spain.—Cortina Award: Jose M. Peman, *Trilogía Dramática.* Spanish National Prize for Literature: Garcia Mercadal, *Aire, Tierra y Mar.* (*See* also Children's Books.)

Bibliography.—For historical information, *see:* Charlotte E. Murray, *Famous Literary Prizes* (1934); Bessie Graham, *Famous Literary Prizes and Their Winners* (1939); *Books Abroad* (University of Oklahoma).
(M. A. Wr.)

Literature: *see* American Literature; Canadian Literature; English Literature; French Literature; Italian Literature; Literary Prizes; Publishing; Radio, Industrial Aspects of; Spanish-American Literature.

Lithuania, Baltic country of north-central Europe, N. of Poland. Area 22,959 sq.mi. (as of July 1, 1940); population (Jan. 1, 1940) 2,879,070. Chief towns: Vilnius (Vilna, capital, 207,750 approx.); Kaunas (still the real seat of government, 152,365).

History.—Territorial disintegration had begun in 1939 with the cession of Memel (March 22), and the forced withdrawal of all Lithuanians from the city in November.

On Oct. 10, 1939, Lithuania signed a pact with the U.S.S.R. by which she gained most of the long-coveted city and district of Vilnius, the ancient capital (Vilna, with total population of 457,500), and granted to soviet Russia rights of garrisoning certain forces in the country.

Precariously she maintained independence until, in June 1940, Premier Antanas Merkys went to Moscow "to conduct negotiations" and was joined by the foreign minister, Juozas Urbsys, on June 10. A month later Lithuanians went to the polls to vote on the question of inclusion in the soviet union (July 14). A number of protective arrests helped to quiet opposition, the proposition won, and on Aug. 3, 1940, Lithuania was accepted by the soviet supreme council as the 14th republic of the soviet union. Some 82,000 additional people in the Vilna district were added to the new republic.

President Smetona fled the country, and some 12,000 Jews and war refugees sought to get to Japan in an attempt to continue on to Dutch New Guinea. The Lithuanian ministers in London and Washington were on Aug. 3 deprived of citizenship and their prop-

"THE PIED PIPER OF MOSCOW" had an assistant in persuading the three small Baltic republics to apply to the U.S.S.R. for admission July 21, 1940, according to Elderman of the *Washington Post*

erty confiscated by the new Lithuanian government. The new order of things was not recognized by Great Britain, which held Lithuanian ships in its harbours. Nor was it recognized by the United States, which froze all American assets of the overthrown government and people. Nevertheless, early in September the U.S.S.R. forced the closing of American diplomatic and consular offices in Lithuania as well as in the other Baltic states.

Education and Religion.—(1938–39) 2,335 primary schools, 298,429 scholars; 27 secondary schools, 2,633 scholars; 56 gymnasia, 16,906 scholars; university at Kaunas, 3,041 scholars. Part of the university was moved on Jan. 15, 1940, to Vilna.

Roman Catholics, 80·5%; Jews, 7·3%; Protestants, 9·5%; Greek Orthodox, 2·5%.

Banking and Finance.—Budget est. 1939: revenue, 341,785,274 litas; expenditure, 341,785,274 litas.

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Little Entente. The Little Entente, a defensive alliance of Czechoslovakia, Rumania and Yugoslavia, against Hungarian aggression, ended without any formal declaration in 1939 by the extinction of Czechoslovakia, perhaps the leading partner in the entente.

Of the two remaining states, which, in an informal way, seemed inclined to continue their defensive co-operation against Hungary in 1939, Rumania in 1940 was forced to submit herself to dismemberment by Hungary; the existence of the defensive alliance with Yugoslavia was of no avail to Rumania because Hungary did not declare war, but received a part of Rumanian territory by negotiation and arbitration, although under duress and violent protest on the part of Rumania. On the other hand, Hungary did not press her territorial claims against Yugoslavia, and at a visit of the Hungarian foreign minister, Count Stephen Csaky, to B grade in Dec. 1940, a permanent treaty of peace and friends was concluded between the two countries. In such a way Little Entente, which had come into being on Aug. 14, 1920, the conclusion of a Czechoslovak-Yugoslav defensive treaty alliance and by a similar treaty between Czechoslovakia and R mania on April 23, 1921, followed by a Rumanian-Yugos treaty on June 17, 1921, came definitely to an end in 1940. (also CZECHOSLOVAKIA; HUNGARY; RUMANIA; YUGOSLAVIA.) (H. Ko.)

Livestock. The greatest change in the world's supply of m animals in 1940 was in swine, a condition resu ing from war interference with the normal processes of prod tion and international trade. The supply of meat from hogs c be increased enormously in a single year, more rapidly than fr cattle or sheep or any other practical source. As a consequen countries at war and in urgent need of larger food supplies deavoured to increase hog production, while in peaceful natio pork production created a surplus that could not be shipped cause of war restrictions on international trade. In Canada, 19 hog production broke all records. The spring pig crop of 5,10 000 head was 39% above 1939. The fall pig crop in 1940 w 4,500,000 head compared to 3,700,000 in 1939. Canadian outp of pork products in 1940 (preliminary estimate) was 1,035,00 000 lb., not including lard.

Although the British government greatly increased its stand order for weekly shipments of pork to the United Kingdom, Ca ada had a surplus. In the United Kingdom the food minis raised the price of fat hogs July 1, 1940, from $19.12 per 100 dressed weight to $21.13, marking a rise of $7.06 per 100 lb. si prices were fixed Oct. 13, 1939. This price was reduced to $19 Oct. 1, 1940. In France the government urged farmers to grea efforts in pork production, but here, as in other European cou tries, a shortage of feed and the necessity of using feed gra for food for refugees and an army of occupation kept producti down. In Denmark, normally a large exporter of pork to t United Kingdom, hog numbers Nov. 1, 1940, were estimated 2,500,000 compared to 3,230,000 a year earlier and it was report that scarcity of feed would cut the number to 2,000,000 (rep of the office of foreign agricultural relations, U.S. department agriculture).

Germany apparently had approximately a normal hog supp 29,100,000 head Jan. 1, 1940, including the Sudeten and Austr but in five important exporting countries supplies were down 13 in 1940 to 13,569,000 head (Hungary, Yugoslavia, Ireland, De mark and Lithuania). In the United States curtailed Europe markets, an abundance of supplies and an unfavourable hog-co price ratio caused substantial decreases in the spring and fall p crops. Argentina also had a surplus because of lack of Europe outlets. (*See* HOGS.)

European countries generally made strenuous efforts to mainta dairy herds in 1940 owing to a shortage of butter and milk and c spite scarcity of feeds. The number of cows and heifers two yea old or over in 18 European countries, representing 70% of t European herds outside Russia, was reported as 42,084,000, an crease of about 10% since 1930. In Italy the marketing of be cattle was put under government control Sept. 19, 1940. A pre ous regulation had directed cattle growers to reserve 30% of animals over 276 lb. for government use. In the United Kingdo the food ministry emphasized quantity production rather th quality production of beef in feeding operations. In the Unit States the total number of all cattle increased about 2,000,000 1940 and was approximately 70,800,000 head Jan. 1, 1941. T peak was 74,300,000 head in 1934, but the drought in that ye

ıd in 1936 was followed by a reduction in numbers to a low of 5,100,000 in 1938 (*see* CATTLE; DAIRYING). A number of Euro-an countries suppressed livestock and other agricultural statis-cs as a war-time measure. Neither comprehensive nor very re-nt figures were available. The U.S. office of foreign agricultural lations reported that there were about 10,000,000 head in Ger-an dairy herds Jan. 1, 1940, compared to 9,962,000 a year earlier. o 1940 figures were available from France, the United Kingdom, e Netherlands, Hungary, Sweden and Eire, but 1939 reports owed dairy herds of 8,732,000 (cows only) in France; 3,885,000 the United Kingdom; 1,926,000 in Sweden; 1,566,000 in the etherlands; 1,345,000 in Eire; 1,103,000 in Hungary. Denmark ıd 1,618,000 Jan. 1, 1940, compared to 1,625,000 a year earlier. o reports were available of what disposition the German army of cupation may have made of the prize purebred dairy herds on e Channel islands of Jersey and Guernsey where the famous Jer-y and Guernsey breeds originated. Herds of purebred Jerseys ıd Guernseys, however, are so numerous in the United States and e United Kingdom that the Channel island stock could readily e replaced, American breeders pointed out. The world picture of estock and livestock products in 1940 was a sharp contrast of ant and the rationing of meat, dairy products, wool clothing and en leather shoes in Europe, while in the Americas, Australasia ıd South Africa there was an abundance of these supplies, even n unusable surplus of many. There was no material change in eep production in 1940, except the universal problem of find-g available markets for mutton and wool. For work animals, e HORSES. (*See* BACON; BUTTER; CHEESE; MEAT; MILK; HEEP.) (S. O. R.)

ivestock Shows: *see* SHOWS.

ocal Government: *see* MUNICIPAL GOVERNMENT.

odge, Sir Oliver (Joseph) (1851–1940), English sci-entist, was born in Penk-ıll, England, June 12, and died at his home in Amesbury, Aug. 2. For a biographical sketch see *Encyclopædia Britannica,* vol. 1, p. 293.

ondon. Life in London during 1940 fell into two clearly dif-ferentiated portions, with mid-August as the dividing oint. In the first, "behind-the-lines" conditions prevailed, and in ite of the black-out, the ubiquitous shelters and sandbags, the fects of evacuation, the presence of A.R.P. officials in full train-g and of soldiers, and latterly the home guard drilling in the ırks, life went on much as usual. The winter had been severe, ıt the summer was very fine, and in their leisure hours Londoners ıronged the parks or dug strenuously in their allotments and ardens. Several theatres and many cinemas were open, and there ere even a few sporting events. In the second period, when the rgest and commercially the most important city in the world, ith a record of nearly 20 centuries of life unhindered by the for-gn invader, was assailed from the air by an enemy armed with l that science and ingenuity could devise, London accepted her front-line" position with all that that entailed. The A.R.P. serv-es sprang into efficient action, and the civilians, while maintain-g the work, business and efficiency of their city, proved that ıough her walls, her palaces, her churches and her homes might e reduced to rubble, her spirit could never be broken. During ıe whole period, though disorganization of communications was equent and sometimes serious, no essential service was more ıan temporarily impaired. No cut was made in necessary ex-enditure on the social services; and public and private premises, xcept when irreparably damaged, were repaired as speedily as ossible—latterly with the help of the royal engineers and the pioneer corps. In that way thousands of business people determined to maintain their regular occupations were enabled to do so with delays of only hours. It was even possible to make a few additions to the Green Belt, but the improvements foreshadowed in the Bressey report of 1938 were perforce postponed. Among other works, the completion of Waterloo bridge with its proposed "roundabout" in the Strand, the development of the south bank of the Thames, the memorials to King George V and to Jellicoe and Beatty, and the University of London buildings were also held up.

In March, A. Emil Davies, economist and a leading member of the London County council, succeeded Mrs. E. M. Lowe as chairman, and in May Herbert Morrison, M.P., following his appointment as minister of supply, resigned the leadership and was succeeded by Charles Latham, chairman of the finance committee. The rate for 1940–41 showed a reduction of 3*d.* at 7*s.* 6½*d.*, and the ratable value a slight increase at £62,880,000. The March estimates were £45,447,708 on maintenance account (including £1,250,000 as special provision for contingencies), and £7,794,000 on capital account; of the £9,407,500 budgeted for civil defence government grants covered all but £1,069,693. Owing to treasury restrictions and the wartime necessity to control capital outlay capital expenditure allowed for was only little over half that of the previous year; no provision was made, however, for the reparation of war damage, though an undertaking that such expenditure would be met if need arose was given. Shelters, black-out, etc., at County hall cost £18,000 (about £6,500 ranking for grant); staff evacuation, with hire of premises and incidental expenses, cost £39,675, the annual extra cost of maintenance being estimated at £23,000. The water supply was protected against air attack at a cost of £390,736, and the council's institutions, homes, casual wards, etc., at £40,000.

London had taken early steps to defend herself against attack. In April 1939, two regional commissioners, Sir Ernest Gowers, chairman of the coal commission, and Admiral Sir Edward Evans, had been appointed. In May 1940 they were joined by Captain D. Euan Wallace, M.P., as senior commissioner, and at the end of September two special commissioners were added: H. Willink, K.C., M.P., to supervise the care of the homeless, and Sir Warren Fisher, a former head of the civil service and lately commissioner in Manchester of the northwest area, to co-ordinate and facilitate reconstruction. In October Sir Edward Evans was put in charge of air raid shelters and Dr. Mallon, warden of Toynbee hall, was appointed by the minister of food as adviser on the catering problems connected therewith. A fund for the relief of distress caused by enemy action in London was opened by the lord mayor on Sept. 10. Contributions poured in from every part of the world in such profusion that on Oct. 28 its scope was extended to cover the whole of the United Kingdom and Northern Ireland. By the middle of December it had reached nearly £1,700,000.

Apart from one or two "alarms" in the early days of the war no sirens wailed in London till June 25, but from Aug. 23, when the "blitz" began, until Dec. 2 there was no 24-hour period without at least one "alert"—as the alarms came to be called—and generally far more, nine having been registered on three separate occasions. In the hundred days, Aug. 23 to Nov. 30, there were 368 alerts, and the nights of Nov. 3 and 28 were the only occasions during this period on which London's peace was unbroken by siren or bomb. After the first week of September, though night bombing on a large scale continued, the large mass attacks by day, which had proved so costly to the enemy, were replaced by smaller parties coming over in successive waves; on occasions forces consisting of as many as 300 to 400 machines would cross the coast by daylight and split into small groups, and a few planes would succeed in penetrating London's outer

Upper left: SHELTER FOR WORKERS in a London factory during an air raid of Sept. 1940
Upper right: VOLUNTEERS of London's auxiliary fire service were the heroes of the city's siege by air in 1940. Many worked 20 hours each day; many were kille
Above, left: AN UNEXPLODED GERMAN TIME BOMB which fell near St. Paul's cathedral, London, in Sept. 1940, was safely extracted by the commander of a roy engineers' bomb disposal unit
Above, right: TOWER BRIDGE was clearly visible by night against the backdrop of flaming East End as German bombers began to pay their regular visits to Londo in Sept. 1940
Below: PICCADILLY CIRCUS STATION of the London subway during night air raids of autumn 1940

fences. Air-raid damage was widespread, and the raider was respecter of persons or places. Hospitals, clubs, churches, iseums, residential and shopping streets, hotels, public houses, eatres, schools, ancient monuments, maternity homes, newsper offices, embassies and the zoo were bombed. While some the poorer and more crowded suburban areas suffered severely, mansions of Mayfair, the luxury flats of Kensington and ckingham palace itself—which was bombed four separate nes—fared little better; but such was the determination of the izens and the high degree of efficiency attained by the A.R.P. d medical services that casualties, though sometimes heavy, at time approached the estimates that had been made before r broke out and only a fraction of the hospital and ambulance vision that had been made was ever requisitioned.

The following curtailed list identifies some of the better known ces in inner London that have been damaged by enemy action. me are a total loss; others are already under repair with little tward sign of the damage sustained:

Besides Buckingham palace, the chapel of which was wrecked, d Guildhall (the six-centuries old centre of London civic cerenies and of great architectural beauty), which was destroyed fire, Kensington palace (the London home of the earl of hlone, governor general of Canada, and the birthplace of een Mary and Queen Victoria), the banqueting hall of Eltham lace (dating from King John's time and long a royal residence), mbeth palace (the archbishop of Canterbury), and Holland use (famous for its 17th century domestic architecture, its litical associations, and its art treasures), suffered, the latter erely. Of the churches, besides St. Paul's cathedral, where at e time were five unexploded bombs in the immediate vicinity d the roof of which was pierced by another that exploded and ttered the high altar to fragments, those damaged were Westnster abbey, St. Margaret's Westminster, Southwark cathehl; fifteen Wren churches (including St. Brides, Fleet St.; Lawrence Jewry; St. Magnus the Martyr; St. Mary-at-hill; Dunstan in the East; St. Clement (Eastcheap) and St. mes's, Piccadilly). St. Giles, Cripplegate, and St. Mary Wolth, also in the city, were damaged, while the Dutch church Austin Friars, dating from the 14th century and covering a ger area than any church in the city of London, St. Paul's ne excepted, was totally destroyed. Islington parish church, rebuilt Our Lady of Victories (Kensington), the French urch by Leicester square, St. Anne's, Soho (famous for its isic), All Souls', Langham place, and Christ Church in Westnster Bridge road (whose tower—fortunately saved—commemates President Lincoln's abolition of slavery), were among a ge number of others. Over 20 hospitals were hit, among them e London (many times), St. Thomas's, St. Bartholomew's, and e children's hospital in Great Ormond st., as well as Chelsea spital, the home for the aged and invalid soldiers, built by ren. The famous places damaged include the palace of Westinster and Westminster hall, the County hall, the Public Record ice, the Law Courts, the Temple and the Inner Temple library; merset house, Burlington house, the tower of London, Greench observatory, Hogarth's house; the Carlton, Reform, Ameri-n, Savage, Arts and Orleans clubs; the Royal College of Surons, University college and its library, Stationers' hall, the M.C.A. headquarters, Toynbee hall and St. Dunstan's; the nerican, Spanish, Japanese and Peruvian embassies and the ildings of the *Times* newspaper, the Associated Press of Amer-, and the National City bank of New York; the centre court at imbledon, Wembley stadium, the Ring (Blackfriars); Drury ne, the Queen's and the Saville theatres; Rotten row, Lambeth lk, the Burlington arcade and Madame Tussaud's. Stores whose mes and goods are known all over the world were damaged in Oxford street, Regent street, Piccadilly, Cheapside and elsewhere, and the new police station in Saville row was nearly demolished. According to official figures air-raid casualties in London to the end of October amounted to about 27,200, of which some 11,200 were fatal. (L. H. D.)

London University. At the beginning of the second year of war there was little new to be said about the university. The colleges remained scattered, though some minor geographical adjustments had been made. The wisdom of dispersal, however, could no longer be doubted, and it was remarkable how well the university functioned under difficulties which its organization in colleges made it possible to overcome. The number of students for degree examinations was not greatly below normal, and in engineering the number was slightly higher than usual. The quality of the work was noticeably good, evidence of the serious attitude of students in a time of national emergency.

Students, technical and non-technical, were interviewed by the university joint recruiting board and allocated to employment suitable to their training, experience and personality, in the services or in industry. Many were reserved from military service for the purpose of completing a technical or scientific qualification. An increasing number of teachers was engaged on work of national importance, but the remaining staff continued the basic work and, in addition, was taking an active interest in educational schemes connected with the services. In many ways the colleges were making important contributions, direct and indirect, to the war effort. (S. J. W.)

Loree, Leonor Fresnel (1858–1940), U.S. railroad president, was born in Fulton City, Ill., April 23, and died in West Orange, N.J., Sept. 6. For a biographical sketch see *Encyclopædia Britannica,* vol. 14, p. 393.

Los Angeles, county seat of Los Angeles county, largest U.S. city west of Chicago, and fifth in the nation, has an area of 442 sq.mi., a 1940 census population of 1,504,277 (102,479 in 1900), a gain of 250,744 in a decade. The population of the county is given as 2,277,211. Mayor: Fletcher D. Bowron.

Fatalities from automobile accidents in 1940 were again high (above the 1,000 mark for the county), despite extraordinary endeavours for safety. John Dockweiler was elected district attorney over Buron Fitts, who served the county 12 years.

Tourists again brought much "imported wealth" to southern California. Building permits placed Los Angeles second only to New York, with upwards of $63,000,000 for the first ten months. The 1940 fiscal year saw 85,027 carlots of produce unloaded in Los Angeles market. Lake Mathews (named for William Burgess Mathews), containing 30,000,000,000 gal. of water for 13 cities of the metropolitan district, was formally dedicated Nov. 17. Opening of the All-American canal to Imperial valley (Oct. 13), after six years of construction, is significant for all southern California. The beautiful William Mulholland memorial fountain, in commemoration of the man who pioneered the work of developing an adequate water supply, was dedicated Aug. 2 at Los Feliz boulevard and Riverside drive.

The 41st Encampment of the Veterans of Foreign Wars (Aug. 26) brought 60,000 visitors. The centenary of the appointment of the first Catholic bishop of California (Most Reverend Francisco Garcia Diego y Moreno) and the convention of the Confraternity of Christian Doctrine brought distinguished prelates and culminated (Oct. 13) in the city's largest religious gathering, in Los Angeles Coliseum.

New airliner service without change to New York was inaugurated Aug. 20, using interchange of equipment of United Air Lines and Western Air Express. Work progressed rapidly on the more adequate 640-acre airport at Inglewood. Ten coast-to-coast airliners daily bring mail to Los Angeles. Extraordinary activity was seen in the aviation industry as an integral part of national defence, with a backlog of unfilled orders amounting to hundreds of millions of dollars. Demand for petroleum and gasoline was heavy.

The open-air theatre for the University of California at Los Angeles will be completed for the 1941 commencement. The Hancock Foundation building for biological research added significantly to the equipment and resources of the University of Southern California. At Occidental college two new dormitories, Haines hall and Wylie hall, were dedicated Nov. 29. (R. D. Hu.)

Lothian, Philip Henry Kerr, 11th Marquess of (1882–1940), British diplomat, was born April 18 and was educated at the Oratory school, Birmingham, and New college, Oxford. He went to South Africa in 1905, serving in various capacities for the government until 1908, when he became editor of *The State*, a South African publication. He returned to London in 1909 and became editor of the *Round Table* the next year, holding the post until 1916, when he became secretary to Lloyd George, then prime minister. He was made director of United Newspapers, Ltd., in 1921, chancellor of the Duchy of Lancaster in 1931 and parliamentary undersecretary for India in the same year. When a vacancy occurred in the British embassy to the United States he was appointed ambassador in April 1939. His duty in the United States was to obtain all possible assistance for the British in the way of ships, warplanes and munitions. His last speech, read by an associate the night before he died, was a plea for assistance, with the assurance that the British with the help of the United States could successfully combat what he called the gangster menace that was endangering liberty throughout the world. He died in Washington, Dec. 12.

Louisiana, first state carved from the Louisiana purchase, is one of the west south central states of the United States of America. It was admitted to the union in 1812 and is popularly known as the "Pelican state" or "Creole state"; area 48,506 sq.mi.; population according to U.S. census of 1940, 2,363,880, of which 980,439 are urban, or 41.5%. Capital, Baton Rouge, 34,719. The only cities with larger population are: New Orleans, 494,537; Shreveport, 98,167. Of the total population of 2,101,593 in 1930, 1,318,160 were whites; 776,326 Negroes; 2,064,517 native born; 37,076 foreign born.

History.—In the presidential election official returns for the popular vote of Louisiana gave Roosevelt 319,751 and Willkie 52,446.

The public scandal exposures of 1939 provided the chief issue in the state Democratic primary election of Jan. 16, 1940. In the hotly contested campaign Governor Earl K. Long led the administration machine forces, while the other four gubernatorial candidates ran upon reform platforms. The first primary was indecisive and a second was held on Feb. 20, in which Sam Houston Jones defeated Earl K. Long for governor and the Long machine which had dominated state politics for 12 years was overthrown.

The new anti-Long legislature met on May 13 in regular 60-day biennial session and on the following day Sam Houston Jones was inaugurated as governor. A comprehensive program of reform legislation was enacted, designed to eliminate political graft and corruption, ensure economy and efficiency in the public service and prevent any recurrence of political dictatorship or public scandal. The chief reform acts provided for: a reorganized state administrative system, centralizing authority and responsibility in a few key officials and boards; a revised state fiscal system to prevent extravagance and misuse of public funds; the elimination of recognized abuses in the electoral system; a state civil service system to end political jobbery and ensure efficiency in the public service; a revised state tax structure, repealing the unpopular sales tax and increasing taxation on those citizens and corporations most able to bear it; the creation of a crime commission with sweeping powers to ferret out and punish persons guilty of peculation in handling public funds; the clarification of certain sections of the Civil Code and Code of Practice; the correction of defects in criminal law and procedure revealed during the scandal investigations; and the removal of schools and other public institutions from political control and placing them on a basis of economy and efficiency.

GOV. SAM JONES of Louisiana, Democrat, elected April 16, 1940

Other notable progressive movements of 1940 were: continuation of federal and state investigation of public scandals; expansion of the industrial program; construction of additional farm-to-market roads as part of the state highway system; completion of the combined highway and railway bridge over the Mississippi at Baton Rouge; enlargement of the soil conservation program; extension of the rural electrification system; establishment of additional trade schools and parish libraries; development of new petroleum fields; continuation of federal flood control; and the location of important federal military training camps within the state.

State officers: Sam Houston Jones, governor; Mark M. Moutoux, lieutenant governor; James A. Gremillion, secretary of state; A. P. Tugwell, treasurer; L. B. Baynard, auditor; Eugene Stanley, attorney-general; John E. Coxe, superintendent of education.

Education.—Education is free and compulsory for all children. Separate schools are maintained for whites and Negroes. Over 500,000 pupils are enrolled in elementary and high schools, 10% of whom are in private and parochial schools.

Charities and Correction.—The state maintains the following: charity hospitals at New Orleans, Shreveport, Lafayette, Pineville, Independence and Monroe, under the social security program; insane hospitals at Jackson and Pineville; a tuberculosis hospital at Greenwell Springs; schools for the deaf and blind at Baton Rouge; training school for feeble-minded at Alexandria; soldiers' home at New Orleans. There are also numerous private and endowed hospitals and orphanages. The state maintains three prison farms for adult offenders, and separate training institutes for male and female juvenile delinquents.

Banking and Finance.—There are about 120 state and 3[illegible] national banks, with total assets of $500,000,000, deposits of $450,000,000 and capital, surplus and reserves of $50,000,000. The state's bonded debt is approximately $150,000,000; assessed valuation of property $1,400,000,000; annual state budget $60,000,000.

Agriculture, Manufactures, Mineral Production.—Cotton, sugar cane, corn, rice, sweet and Irish potatoes, and hay are the chief staple crops, valued at nearly $200,000,000 annually. How-

r, severe freezes in January and a late, cold spring injured sugar cane and excessive summer rainfall damaged the cotton l rice crops, reducing the 1940 value of these three staple ps to $24,000,000 below that of the preceding year. Dairying, ck-raising, citrus fruit culture and truck and vegetable garning are also important agricultural activities. Louisiana ranks rd among the states in lumber production. Nearly 1,700 inistrial establishments, with 76,000 employees, receiving $60,-0,000 annually in wages, produce commodities valued at $580,-0,000.

Principal manufactures are lumber and other wood products, oil l other cotton-seed derivatives, rice products, paper, refined ar, petroleum products, carbon-black, chemicals, ice, canned etables and sea-foods and tropical clothing. Petroleum, natl gas, salt and sulphur are the chief mineral products, with mbined annual value of $175,000,000. (W. Pr.)

mber. Production in the United States for 1940 was estimated at 28,000,000,000 board feet, or about 10% ove that of 1939 and considerably above the 21,646,000,000 ard feet reported by the United States census bureau for 1938. e leading species of lumber, in order of rank, continued as lows: southern pine, Douglas fir, ponderosa pine, oak, white e, hemlock, red gum, cypress and maple. Altogether, about species of trees enter prominently into commercial lumber oduction. Southern pine was produced from 21 southern and theastern states of which seven cut more than 500,000,000 ard feet each. One of the first states to be lumbered, North rolina, produces more lumber than any other southern state. is is evidence of the recuperative and reproductive powers of uthern pine. Douglas fir is cut throughout the Rocky mountain d Pacific coast states, but Washington and Oregon contribute out 95% of the total value of this species. Ponderosa pine is t principally in Oregon and California. Lumber production is ll well below the pre-depression level.

The European war and the subsequent development of a nanal defence program were responsible for a marked increase lumber requirements for the nation. During 1940, it is estiated that approximately 1,500,000,000 board feet of lumber re produced for army and navy requirements. Much of this mber was used for the construction of cantonments for troop using; also for tanks in power plants, boxes for the shipment munitions, food, etc., lockers, furniture and many miscellanes items. In addition, the U.S. Housing authority arranged to ild considerable defence housing.

It is estimated that the entire needs for the defence program approximate m 4,000,000,000 to 5,000,000,000 board feet over a period of two to r years or more. Increase in lumber demand for the defence program ally affected industrial activity and the general use of lumber and tims for construction throughout the country. Upward readjustment of ces resulted from this increased demand. This elevation of prices also ulted in a number of sawmills increasing their output by going on night fts.

Lumber exports fell sharply due to the war in Europe. Normally the lk of U.S. exports go to Great Britain. It is estimated that total lumber ports for 1940 were about 20% below those for 1939. Nearly all items lumber exports, including logs, timbers, boards, cross-ties, and many er forms, suffered, with the exception of box shooks. On the other hand, bstantial quantities of construction lumber, principally Douglas fir and uthern pine, were purchased by the United Kingdom and shipped for r purposes.

It is believed that losses incurred by curtailment of the European mart will be offset by gains in the Central and South American lumber trade. ports of lumber and logs gained somewhat, but did not offset the losses e to the export situation.

The use of timber connector construction showed an appreciable gain d expansion during 1940. This was particularly true as applied to U.S. using authority purchases, the construction of CCC camps, various fence projects, harbour and dock improvements, and railroads. Timber nnector construction was widely extended to Canada and Great Britain r defence construction.

Simplified practice recommendations defining U.S. standards for softod lumber were revised and published in 1940 by the U.S. bureau of andards. (N. C. B.)

Other Countries. — The timber industry underwent further drastic changes in 1940. Poland and Finland, both leading timber export countries, were, of course, out of the picture at the beginning of the year, Poland having been overrun by Germany in the earliest stage of the European war, and Finland being later in conflict with Russia. Norway, another exporting country, though less important, was then involved, and subsequently Denmark, Holland and Belgium (all timber importing countries) were occupied by the Germans. Sweden, maintaining her neutrality, was alone in a position to export, but in her case opportunities were extremely limited since all her leading buyers, apart from Germany, were cut off.

When the Russo-Finnish conflict ended, Russia added greatly to her timber resources. The first estimates were that, as a result of the cession of territory to Russia, Finland lost saw mills and woodworking establishments with an aggregate annual production of 200,000 standards of timber, together with important forest areas and valuable yards at the shipping ports of Viipuri and Trangsund.

Later in the year Latvia, Estonia and Lithuania, which all had a substantial timber export business, became absorbed in the soviet union.

Great Britain, chief timber importing market, cut off from her usual European sources of supply, drew increasingly from the empire, notably Canada, and from the United States, and also developed greatly the felling and conversion of home-grown timbers. Forestry workers from Newfoundland were drafted into England and Scotland for work in the woodlands.

All countries ceased the issue of detailed timber trade statistics, so that comparisons are impossible. Aggregate figures in Great Britain, however, showed that timber imports in the first eight months of 1939—eight months of peace—totalled £27,090,265, and in the corresponding period of 1940 under war conditions totalled £23,201,657. The figures were not a true reflection of the market (freight rates had been much higher); even so, they indicate in a measure how well imports to Great Britain were being maintained.

The British government's timber control department was further developed. The timber controller was in the position of being sole buyer for the country, and of controlling disposal of the national timber supplies. Wartime stocks were being apportioned by means of quotas, and stockholders themselves were disposing of the wood to consumers only under licence. Canada, too, appointed a timber controller in 1940, the operations of his department, of course, being confined to the timber trade of the dominion itself. (*See* also Forests.) (N. F.)

Lundeen, Ernest (1878–1940), U.S. senator from Minnesota, was born in Beresford, S.D., and was graduated from Carleton college in 1901 and from the law school of the University of Minnesota in 1904. He was admitted to the bar in 1906 and began practice in Minneapolis. He served two terms in the Minnesota legislature and was elected to congress in 1916 on the Farmer Labor ticket, serving one term during which he voted against entering the war and against conscription. He was again elected in 1932, and after serving two terms was elected to the senate. He was killed in an aeroplane accident near Lovettsville, Va., Aug. 31.

Lutherans. The year 1940 was a year of great anxiety and responsibility for Lutherans throughout the world, on account of the war in Europe. Early in the year the invasion of Finland involved the whole population of that country in acute distress, in which the whole Lutheran church shared, since about 98% of the people of Finland are members of the Lutheran church. The policies of the government involved all church interests in Germany where a large percentage of the population is Lutheran. So with many members of the Lutheran church in Poland and other small countries involved in the war. Then followed the invasion of Denmark and Norway, known as Lutheran countries, and, later, portions of France, with a substantial Lutheran membership.

One result of these political disturbances was a condition which made communications between European and American groups practically impossible and led to the indefinite postponement of the Lutheran World convention, appointed to meet in Philadelphia in May 1940.

Another result of the European war was to place the responsibility for the support of foreign missions, previously supported by the European churches, upon the Lutherans in America. Some of the largest Protestant missions in the world are among these missions which have come under the care of the Lutherans in America. Such missions are located chiefly in Africa, China and India.

The year 1940 was a year of important conventions for the Lutheran bodies in America. The meetings of the United Lutheran

church in America, the American Lutheran church and the American Lutheran conference were the most significant, since they dealt with the questions of the union of all Lutheran bodies in America and with enlarged co-operation in common tasks, especially emergency provision for the foreign missions left without support on account of war in Europe. All Lutheran bodies in America recorded gains in membership and in contributions in 1940. (W. H. G.)

Luxembourg. Formerly an independent state, it is southeast of Belgium, with which it was connected by an economic union in 1922. The state was first created by the Treaty of London, April 19, 1839, and was ruled after the World War of 1914–18 by the Grand Duchess Charlotte. Area, 999 sq.mi.; pop. (1937) 300,732; chief town, Luxembourg (cap., 59,760); language, Luxembourgian (idiomatic), and (officially) French and German; religion, mainly Roman Catholic.

In 1939, just before the outbreak of the European war, Luxembourg received assurances of respect of her neutrality from Germany and France, and these assurances were observed for more than seven months. But on May 10, 1940 German troops suddenly swept into the country and occupied it, and the Grand Duchess fled, eventually to the United States. On Aug. 14 the constitution was declared void by Dr. Simon, German civil administrator, use of the terms "Grand Duchy" and "State of Luxembourg" was prohibited, and Luxembourg was soon incorporated into the German reich. (S. B. F.)

Lynchings. As 1940 drew to a close it was evident that no diminution of lynchings was in sight, as compared with 1939, despite the assertions of southern governors, senators and congressmen during debate on federal anti-lynching legislation that the states could and would prevent lynchings and punish lynchers. As contrasted with the five lynchings of 1939, it was found that as of Dec. 14, four lynchings had taken place in 1940; a fifth death, it was agreed should be classified as a lynching unless some evidence to the contrary developed, while at least four other cases bore many of the earmarks of lynchings but were classified as subject to further investigation.

These were the findings of a meeting at Tuskegee institute on Dec. 14 of representatives of various agencies which compile and publish lynching statistics. Two of the cases agreed upon as being lynchings occurred in Georgia, one in Tennessee and one in Alabama. The fifth case, which the conferees agreed should be classified as a lynching in the absence of any refutation of the evidence gathered to Dec. 14, occurred in Alabama. No one of the 1940 lynchers was punished or even arrested.

There was evident during 1940 a growth of manifestations of the lynching spirit, aside from these cases in which the victims came to their death, against members of unpopular religious and political groups. This tendency became more marked as tension over the European war and fear of U.S. involvement became more widespread.

Most publicized of 1940's lynchings was that of Elbert Williams at Brownsville, Tenn., in June. Williams and several other highly respected, law-abiding citizens, including a minister of the gospel, a business man and a farmer, went to the Haywood county courthouse to ascertain the requirements they and other Negroes would have to comply with to vote in the 1940 presidential election. Shortly afterwards mobs went to the homes of members of the committee late at night. Williams was taken to a swamp and his badly mutilated body was found a few days later floating in a near-by river, tied to a log. The Negro minister and other members of the delegation were forced to flee for their lives and as the year closed were still refugees from Brownsville. No action had been taken, it is believed, to bring the lynchers to justi by the state of Tennessee or the authorities of Haywood count though it is charged the members of the mob were well know investigation by the National Association for the Advanceme of Colored People having resulted in securing the names a evidence against ten members of the mob, which included t peace officers. The federal department of justice was still inves gating the case as 1940 ended.

The Gavagan-Fish-Wagner-Van Nuys-Capper anti-lynching b was passed by the house of representatives by a vote of 252 131 on Jan. 10, 1940. Opposition by southern senators and t weakness of the majority leadership of the senate combined prevent a vote on the bill in the upper house of the congre though 72 of the 96 senators were pledged to vote for the bill.

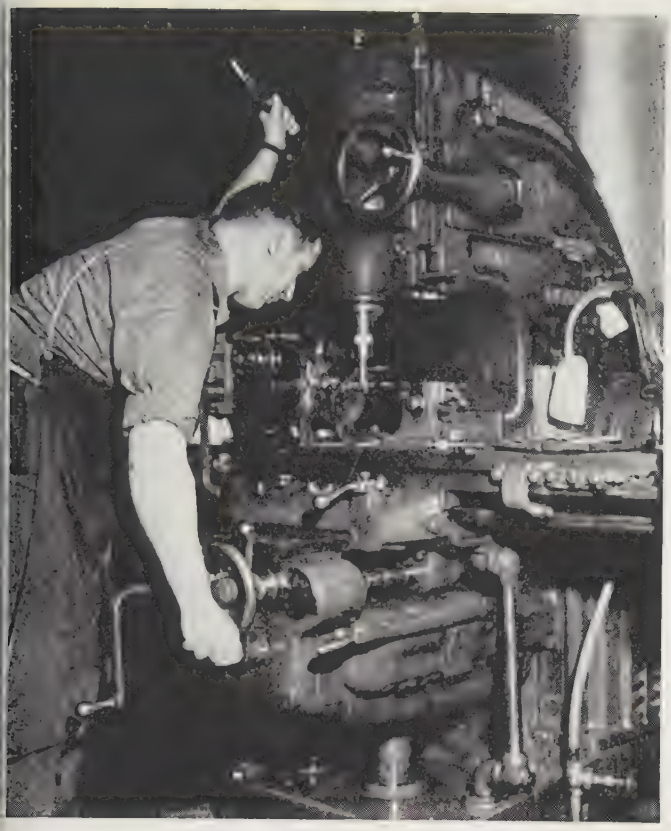
Of the four authenticated lynchings in 1940, three were of N groes and one a white man. These four deaths brought the tot of lynchings in the United States, since 1882, to 5,128; 1,4 white and 3,672 Negro. In 99·2% of the lynchings no punitiv action was taken by the state authorities against the lynche (*See* also NEGROES [AMERICAN].) (W. WH.)

MacBride, Ernest William (1866–1940), British biol gist, was born in Belfast, Ir land, Dec. 12. He was educated in Queen's college, Belfast, S John's college, Cambridge, and London university. He was ma a fellow of St. John's college in 1893 and received the Walsingha medal for biological research in the same year. In 1897 he becam Strathcona professor of zoology at McGill university, Montre and remained in Canada until 1909. In 1913 he was elected pr fessor of zoology in the Imperial College of Science, South Ke sington, and was retired in 1934 as emeritus professor. He w one of the most eminent scientists of Great Britain and attracte wide attention in 1935 by challenging the Darwinian theory evolution. He died in Alton, Hampshire, Nov. 19.

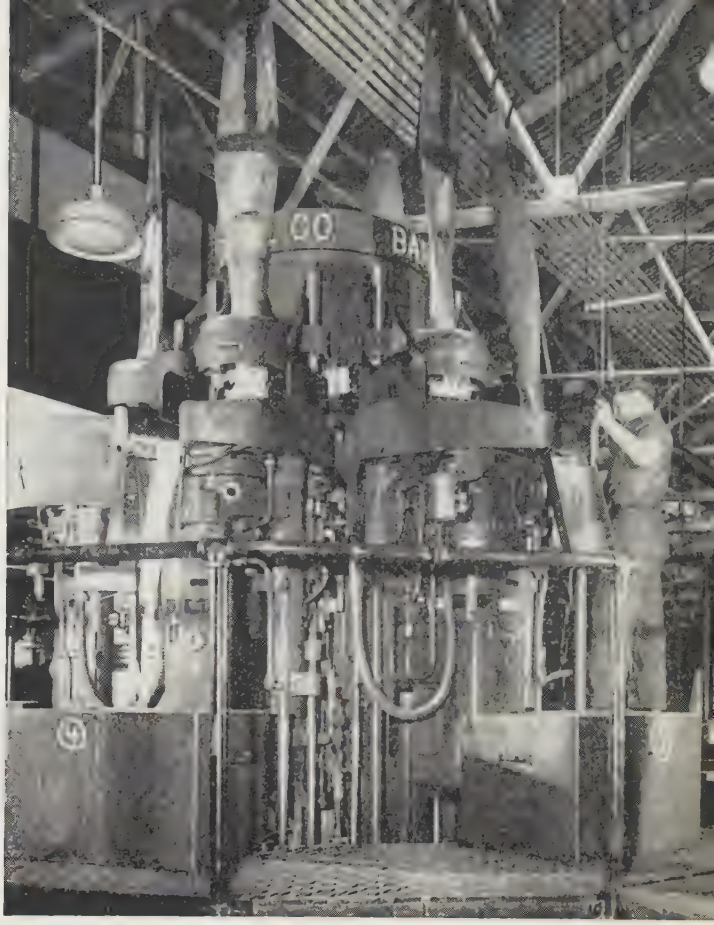
McClellan, George Brinton (1865–1940), U.S. publicis son of Gen. George B. M Clellan, was born Nov. 23 in Dresden, Saxony, while his paren were visiting in Germany. He was graduated from Princeton un versity in 1886, was admitted to the bar in 1892 and in the sam year was elected president of the New York Board of Aldermen In 1894 he was elected to congress and served five terms. H served as mayor of New York city from 1903 to 1909. He was professor and lecturer in Princeton university from 1908 unt 1931 when he was made professor emeritus. He died in Wash ington, D.C., Nov. 30.

McGarrah, Gates W. (1863–1940), U.S. banker, was bor in Monroe, N. Y. In 1898 he becam cashier of the Leather Manufacturers national bank, New Yo city, and four years later was made its president. From 1923 t 1926 he was a director of the Federal Reserve bank in New Yo and in 1927 he was appointed to the Federal Reserve board i Washington. When the Bank for International Settlements w organized in Basle, Switzerland, he was nominated as the represe tative of the U.S. banks on its board and was its president fro 1930 to 1933. After his return to the United States he was elect to the board of the New York Bankers Trust company. He w recognized as one of the ablest U.S. bankers and was a director several corporations. He died in New York city on Nov. 5.

Machinery and Machine Tools. The war and the U. defence program h in 1940 a far-reaching effect on the machine tool industry. No mally machine tool builders do a business of only $100,000,000



ILLED MACHINE OPERATOR working on a torpedo part in the U.S. navy's pedo station at Alexandria, Va., in 1940



NEW U.S. MACHINE which tapers holes in bases of six propeller blades at one time

ove: WORKMEN ARE SMOOTHING DOWN a large screw for a U.S. warship in Bremerton, Wash., navy yards as the U.S. defence program got under way in 40. Elsewhere in the United States an estimated 500,000 workers found jobs munitions and related industries during the year

ght: THIS HUGE HYDRAULIC TESTING AND FORGING PRESS demonstrated 1940 can exert a pressure of 3,000,000 lb.

year. In 1940, however, the volume skyrocketed to $425,000,000 because of the urgent needs of munitions and aeroplane makers. The inevitable result of preoccupation with getting out bigger production was to reduce or defer development programs. Even so, there were almost as many announcements of new and materially improved units during 1940 as during 1939. This is explained, in part, by the large number of new accessories and attachments that were made available.

As in 1939, most of the development during 1940 was in the field of equipment designed for producing fine surface finishes. One of the interesting developments in this field was the announcement early in 1940 of an improved hydraulic universal grinder which incorporates a new mechanical speed changing device in the headstock which eliminates the need for variable-speed motors. An infinite number of work speeds are obtained between 55 and 500 r.p.m. merely by rotating a small handwheel in front of the unit. The table feed on this machine is actuated hydraulically from a circuit which supplies pressure on both sides of the piston. Feed rates are infinitely variable from 3 to 240 in. per min.

Also made available for the first time in 1940 was a cutter grinder for automatically regrinding hobs and formed milling cutters in sizes up to 10 in. diameter and 12 in. face. Like many of the other machines developed, this machine features an hydraulic table drive which affords accurate control of traversing speed. With this drive, the length of stroke can be controlled to suit the face of the work and speed of traverse can be adjusted at any time, even while the machine is in operation. It has been found that the life of hobs between grinds can be increased materially by giving the faces of the teeth a finer finish. This is accomplished by slowing down the table speed on the last circuit of indexing.

In the high-production field, a 34-ton grinder built for snagging three surfaces, the bottom and both ends, of automotive cylinder blocks is of interest. Three operators put five blocks through this machine per minute. Four grinding heads are used, each pair being supported by a massive column. Upon the left-hand column are mounted two heads in line, each carrying an abrasive member for snagging the bottom surface of the block. The first head takes a roughing cut, while the second takes a lighter finishing cut. The two heads on the right-hand column are mounted one above the other so that the grinding members are parallel. A rotary work carrier having six stations is provided, each station carrying a quick-clamping fixture. During operation, a cylinder block is loaded by hand from a conveyor to a fixture, with the bottom surface up, and is carried beneath the first two grinding wheels. After leaving the second wheel it automatically is indexed 90°, so that when passing through the opposed wheels on the right-hand column the two end surfaces are ground simultaneously. Following this operation the block automatically is reindexed to its original position and manually unloaded to a conveyor.

A number of specially designed machines were placed on the market during 1940 for use in the production of such ordnance items as shells, bombs and fuses. These developments cover a wide range, from the simple, single-purpose machine to the multiple-spindle, multiple-tool machine designed for high-production operations. Also, in connection with these operations, carbide cutting materials, especially those suitable for machining steel, were finding increasing applications. Sometimes the increase in production rate made possible by these materials eliminated the necessity for installing additional equipment in a limited floor space. This is particularly helpful when delivery of new equipment necessarily is delayed because of the increased load being carried by the machine tool industry.

Production of military aircraft and aircraft engines at ever increasing rate naturally led to the development of a numb of interesting units for operations either unnecessary on form types of aircraft, or done by hand when only a few parts we to be made. Among these developments was an hydraulic stretc ing press with 600 tons capacity for forming sheet metal forcing a die upward into the work while the two edges of t sheet are restrained in clamps. Basically, the machine is ma up of two separate units of similar design, each of which h two cylinders, two plungers and a common inclinable table. Ea unit also has two motor-driven clamp supports with suital swivelling sheet clamps. The unit quickly can be set up for variety of shapes, such as are required for fuselage work.

In the aircraft engine field, a machine built during 1940 f contour milling of high nickel-chrome master rods for a forei aircraft engine is of particular interest. The machine also suitable for articulated rods and other contour milling ope tions of similar nature by merely changing the master cam cated beneath the work-table fixture plate. The heat-treat master rod is located on the fixture through two drilled holes the large and small bosses. After pressing a button, an automa cycle involving four distinct movements, mills the contour of t rod with all cuts blended together. Both the cutter head and t table slide are operated by hydraulic cylinders, the cutter he advancing or retreating with the master cam outline. Anoth hydraulically operated unit developed during 1940 was a varia speed propeller twisting machine which corrects inaccuracies pitch of 7- to 14-in. wide aeroplane propeller blades. Use of th machine permits the blades to be forged very nearly to t finished size, so that only a small amount of stock need be r moved during the machining operation. It will maintain the a of the twist upon the longitudinal centre line of the work pie The machine may be adjusted to make twists between vario lengths and will operate in either direction to increase or decrea pitch of the blade.

A mass production machine entirely new in principle and d sign, developed for cutting straight-tooth bevel gears, such those used in automobile differentials, washing machines and te tile machinery, was another one of the principal developmen during 1940. Known as the "Revacycle" this machine provid an exceptionally fast method of cutting straight bevel gears, these are both roughed and finished in one operation with single disk cutter. The cutter disk has a number of radia arranged roughing blades followed by a number of similar arranged finishing blades, with a gap between the last finishi and the first roughing blade. This cutter is mounted on a recip cating slide and as the cutter rotates in engagement with the ge blank it moves along the tooth, the action being similar to that a milling cutter. As the cutter moves from the small to the lar end of a blank, the roughing blade cuts out a tooth space. O the return stroke the finishing blades finish the tooth space whi has just been roughed. The blank is held stationary during t cutting cycle and at the end of each return stroke of the cutt the blank is indexed at the gap in the cutter blade. Each revol tion of the cutter completes a tooth space. Conjugate tooth for are produced as a result of the cutter motion and the tooth sha used in the cutter blade. Except for chucking, operation of th machine is entirely automatic. There are no chucking delays, ho ever, since the machine is provided with a rotary work-holding tu ret with three spindles. Thus, gears are removed and blanks load at two stations while cutting takes place at the third.

Among the interesting accessory units made available duri 1940, was an easily portable head for making standard Brin hardness tests, using a 3,000 kg. load on a 10 mm. ball. This un weighs less than 26 lb., and is a precision hydraulic instr

nt that indicates the load directly on an accurate hydraulic ıge. Overload is prevented by an inertia-free release valve. ıuge and valve are independently calibrated and check each ıer. The entire test head is easily detachable from the frame the instrument, so that by using a simple backing-up fixture :ts of large size can be tested on any part of their surface. A croscope is used to measure the diameter of the impression. is microscope can be provided with a lamp and battery attachnt fitted for portable service.

With the initiation of a mass-production program, such as was :essary in the aircraft and ordnance fields, shop personnel ıst be instructed in the operation and maintenance of new types equipment. In addition, a large number of new employees ıst be engaged and trained. One of the greatest obstacles in ; way of heavily increased production in 1940 was the lack of adequate supply of skilled men. Even though some of the chines were of semi-automatic and automatic types, they could ; be operated by wholly unskilled workers. The extreme preion required for many ordnance items, especially units like onautical engines, demanded a type of worker not easily proed. Once the available supply of experienced workers was ıausted, the only course left open was to establish a training ›gram for the unskilled. The development and application of h programs was a subject of major interest to a large number industrial organizations throughout the United States, Canada l Great Britain during 1940. Some plants set up training proms in co-operation with local public school systems, others ensified their apprentice training program and put into operan short-term training plans for semi-skilled operators, while ıers made use of a plan by which a helper was assigned to h machine. For a few weeks he did nothing but watch the lled operator perform his tasks. After this "watching" period, learner usually could take over some parts of the work and ıdually acquired sufficient skill to permit of his assignment to other machine doing the same operation. (*See* also TEXTILE DUSTRY.) (B. C. B.)

cNary, Charles Linza (1874–), U.S. candidate for vice-president on the Republican ket in 1940, was born on a farm near Salem, Ore. June 12. ter studying for two years at Leland Stanford university he gan law practice in 1898 and continued until he became justice the state supreme court in 1913. In 1917 he was appointed S. senator to complete an unexpired term. He was elected to senate for four succeeding terms (1919–42). On June 28 the publican National convention at Philadelphia nominated him vice-president of the United States. McNary, who had never t Wendell L. Willkie prior to the convention, was a proponent TVA and other government power projects, and thus held ews diametrically opposed to those of the presidential candite. In his acceptance speech at Salem on Aug. 27 he declared the public management and development of hydroelectric wer.

cNaughton, Andrew George Latta (1887 –), C.B.; C.M.G.; S.O.; born Moosomin (Sask.) Feb. 25; son of Robert ıncan and Christina Mary Anne (Armour); educated Moosomin blic school, Bishop's college school, Lennoxville, P.Q., McGill iversity (1906–10), B.Sc., 1910, M.Sc. 1912, Senior Demonator in Electrical Engineering (1912–14); Honorary LL.D. 20; married (Sept. 17, 1914) Mabel Clara Stuart Weir: chilen, Christina Stuart, Andrew Leslie, Edward Dalzell, Ian Arur, Leslie Stuart. General McNaughton served conspicuously the World War 1914–18, during which he commanded in succession the 4th battery, 2nd brigade, Canadian field artillery; the 21st howitzer battery; the 11th brigade C.F.A.; and next was appointed counter-battery staff officer of the Canadian corps. Wounded at the second battle of Ypres (April 1915) and again at Soissons (Feb. 1918) he was three times mentioned in despatches, awarded the Distinguished Service Order (1917) and made a Companion of the Order of St. Michael and St. George (1919).

Upon returning to Canada in May 1919 General McNaughton was appointed member of the committee for the reorganization of military forces of Canada, and in 1922 promoted to deputy chief of the Canadian general staff. In 1929 General McNaughton was again promoted, this time to chief of the general staff, a position which he held until asked to be president of the Canadian National Research council (1935). He served in this capacity until Oct. 6, 1939, when he was appointed to his present position, commander of the Canadian active service forces. As head of the National Research council, in addition to contributing numerous papers to technical journals, he particularly directed research in electrical and aeronautical investigations, and was joint inventor with W. A. Steel of the cathode-ray direction finder. At the close of the year (1940) General McNaughton was "somewhere in England" with the First Canadian Army corps by then consisting of two complete divisions together with ancillary troops. (J. T. C.)

McRae, James Henry (1863–1940), U.S. soldier, was born in Lumber City, Ga., Dec. 24. He was graduated from the United States Military academy in 1886 and rose through various promotions to the rank of major general. He commanded the 78th division of the U.S. army in the Meuse-Argonne offensive in the World War in 1918, for which he received the Distinguished Service medal. From 1924 to 1926 he was in command of the Philippine department of the army. For his services in the War of 1914–18 the British made him a Companion of the Order of the Bath. The French made him a Commander of the Legion of Honour and conferred on him the Croix de Guerre with palm. He died in Berkeley, Calif., May 1.

Madagascar: *see* FRENCH COLONIAL EMPIRE.

Magazines and Periodicals. The one great fact in the magazine and periodical business in the U.S. in 1940, as it was in 1939, was the war in Europe, with a definite quickening of interest in foreign and domestic affairs due to chaotic world conditions and national emergency. Magazine readership increased materially, with the biggest gains, as might be expected, in the news field. *Time, Newsweek, U.S. News* and especially *Life* showed formidable circulation gains.

According to *Advertising and Selling*, there were three main viewpoints taken by publishers on what people who were worried about cataclysmal events wanted to read.

First, as in the cases of *Cosmopolitan* and *McCall's*, was that men and women wanted respite from blood and thunder, wanted to read friendly fiction and pleasant home news. A directly opposite approach was the heavy emphasis on war news taken by many magazines—*Life, Look, Liberty*, for example. The third might be termed a neutral or halfway measure. This was emphasis on the reactions of individuals to the war and war conditions, and is exemplified by the articles of André Maurois and Quentin Reynolds in *Collier's*, Jules Romains in *The Saturday Evening Post*, René de Chambrun in the *Ladies' Home Journal*, and many others.

A new quarterly named *Common Ground* was founded in New York. Literal and cultural in nature, it was based on the development of mutual understanding among the many racial types found in the United States. The death of Heywood Broun brought to an

end publication of his *Nutmeg,* issued at Stamford, Conn., a periodical well known and especially admired by literary people and columnists.

The year 1940 showed the emergence as an important force of the accurate surveys on controversial subjects of national interest by *Fortune.* They were widely quoted by the press, and often carefully heeded by administrative and legislative leaders.

So far as classes and types of periodicals were concerned, there was very little change from the general situation which obtained during 1939. "News picture" magazines continued to enjoy great popularity; practically all of them increased their circulations, their size and the variety of their pictures and accompanying texts. A noticeable trend—perhaps due to the war—was an increase in the risqué, and a broader, more passive attitude toward it. The picture technique was not only used in the regular picture magazines but to an increasing extent in general magazines as well.

Light fiction, so-called pulp periodicals and the comic magazines also enjoyed continued popularity and increased circulations, probably also due to a general desire to "escape" the war. The amazingly successful *Readers' Digest* continued to spurn all offers to accept advertising and its circulation passed the 4,000,000 mark, the first time any weekly or monthly publication ever achieved such a figure.

The fact that a foreign language edition for South American consumption was inaugurated also attests to the great appeal of this magazine.

Although comparatively few new publications entered the field, those already there swelled circulations almost unbelievably. The creation of hundreds of thousands of new jobs and the promotions of thousands of men created tremendous interest in business, trade, industrial, technical, professional and specialized publications. Because there was more to talk about, and more to teach and educate about, editorial and advertising content jumped by leaps and bounds.

During the year the United States general public not only fully maintained but further increased its reputation as a reading public. This is reflected in the quantity and variety of the reading material it consumed. At the end of the year there were 6,468 periodicals being published in the United States, an increase over the previous year; 3,501 of these were monthlies, a gain of 35; and 1,366 weeklies, a loss of 33. (R. S. F.)

Great Britain.—The difficulties that beset the periodical publishing business of Great Britain during 1940 could scarcely be exaggerated—nor could the energy and persistence with which they were met and, to a large extent, overcome. Paper supply (*see* NEWSPAPERS), the loss of advertisement revenue, progressive increases in the cost of production led to changes in format, advance in selling prices and in advertisement rates, the banning of "returns," and to other economies. In May came the order prohibiting new issues and posters, and in September another order limiting paper supplies to one-third of pre-war normal, while the censorship and the threat of the purchase tax (happily averted) added difficulties of their own; but in spite of all this casualties were small, while there were even a few newcomers to record.

The following were among the periodicals that either succumbed or suspended publication: the *Grand Magazine, Humorist, Sunday Circle, Good Needlework, Anglo-German Review, Action, Courier, Twenty Story Magazine,* and the *Catholic Bulletin* of Dublin; among the trade and technical press—*Printing, Decorator and Painter, Dairy World, Art and Craft Education, Pianoforte Teacher, Sales Management, Credit World, Home Photographer* and *Photographic Dealer;* while of the sporting press the *British Motorist, Sports Car, Practical Motorist, Speedway World, Skating Times* and *Cyclist* failed to survive. A few trade papers amalgamated, as also did *Woman's Friend* and *Lady's Companion, Woman's Pictorial* and *Home Journal, Bystander* and *Tatler* (for "the duration"), *War Pictorial* and *War Weekly,* and *Stamp Collecting* and *Stamp Review,* among others. A large number of monthlies and weeklies increased their selling price, while some weeklies became fortnightlies or monthlies—among them *Boxing, Practical Wireless, Wireless World* and the *Investors' Review*—and the fortnightly *Vogue* changed to once-a-month.

Turning to the other side of the medal there were among newcomers a revival of the last war's *Blighty,* which was circulated free to all troops overseas, and *Reveille,* a new and bright competitor with a growing circulation among the forces both at home and abroad; *Free Europe* (political and humanitarian); *Practical Engineering, Machine Shop Magazine, Aeroplane Maintenance, Wholesale and Export News* and *Goats,* a trade journal for the encouragement of the breeding of these animals in anticipation of a milk shortage. The *Strand* celebrated its jubilee with its Christmas number, the 600th issue.

In October the industry mourned the loss of Tibor Korda, killed in London as the result of enemy action, the brilliant Hungarian (naturalized British) who founded *World's Press News* (1929), *News Review, Parade* and other periodicals. (L. H. D.)

Maginot Line: *see* EUROPEAN WAR.

Magnesite. Since the absorption of Austria and Czechoslovakia, Greater Germany heads the list of world magnesite producers, with a total close to 600,000 metric tons; intermediate producers, with outputs of 300,000–100,000 tons, include Manchoukuo, United States and Greece. Yugoslavia, Chosen, India and Australia range from 50,000 to 20,000 tons. Total output from these producers was about 1,250,000 metric tons in 1938. The soviet union reported increases in output of as much as 50,000–100,000 tons a year, reaching 482,000 tons in 1934, but these figures are so large in comparison with internal needs and visible exports that they have been received with considerable scepticism in the industry.

United States production of crude magnesite was 199,000 short tons in 1939, while sales included 1,100 tons of crude, 10,100 tons of caustic calcined, and 86,100 tons of dead-burned. The domestic supply was supplemented by 600 tons of crude, 2,200 tons of caustic calcined and 44,400 tons of dead-burned in imports, mainly from Austria and China, with smaller amounts from Czechoslovakia and a number of other producers.

British empire output is comparatively small, totalling about 50,000 tons in India, Australia and South Africa, plus an annual output of 25,000–30,000 tons of magnesitic dolomite in Canada. (G. A. Ro.)

Magnesium. Although magnesium metal has been produced on a small scale for a limited number of uses for a long period of years, it is only since 1922 that its real commercial development began. The metal is now used extensively in a wide variety of light metal alloys, and plant capacity and production are expanding so rapidly that it is difficult to determine current outputs. The estimated 1939 output was 32,800 metric tons, distributed as follows: Germany, 16,500; United Kingdom, 5,000; United States, 4,800; France, 2,500; Japan, 1,800; Switzerland, 700; soviet union, 1,200; and Italy, 300 tons. Practically the entire output is obtained by the electrolysis of magnesium chloride. Plans were under way in 1940 for the expansion of production by all important producing countries. (*See* also METALLURGY.) (G. A. Ro.)

Magnetic Mines: *see* BLOCKADE.

iil-Order Business, a commercial enterprise which carries on its retail transactions primar- by mail, and while found in other parts of the world, has ched its highest stage of development in the United States.

The mail-order business had its inception during the era of id expansion following the Civil War. Due to geographical sons, Chicago, Illinois, became the centre of this business, and ıains so to this date. Montgomery Ward started in Chicago in 72, and Sears, Roebuck and Co., now the largest mail-order ıse, started in North Redwood, Minnesota, in 1886, but moved Chicago the following year. Other smaller mail-order comıies got their start during this same period.

Isolation of farmers due to poor transportation facilities, high racy of the U.S. public, increased earning power of the sses, inability of local retailers to meet consumer demands, ces charged by local retailers, convenience of the mail-order thod, truthful advertising, guarantee of satisfaction, wide setion of merchandise offered by mail-order houses, combined h the popularity of the parcel post system, all were important ıtributions to the success of the mail-order method of selling.

Although from its inception the mail-order method of distribun met with a measure of success, it was not until the turn of : century that the rapid expansion of mail-order sales got under y. For example, in 1900 the gross sales of Sears, Roebuck and . were $11,000,000; by 1906 they had increased to more than),000,000. Annual sales continued to increase until by the end 1940 the combined sales of mail-order and retail operations l reached the huge sum of $749,307,718, the largest in comıy history. The course of Montgomery Ward & Co., and other il-order companies to a more or less degree parallels that of ırs.

The increased expansion noted above is to some extent attribıle to large quantity purchases and to operating economies uliar to the mail-order business, both of which have enabled se companies to raise the general standard of living by offer- better quality merchandise at the same price charged elsere, or the same quality at a lower price.

Certain tendencies in the mail-order business are becoming ıre apparent. Examination of current catalogues reveals an reased emphasis upon private brands: *i.e.,* upon merchandise ınufactured and sold under the proprietary trade names of the il-order houses. Instalment account sales have also greatly reased, not from a lowering of credit standards, but by making ailable all kinds of merchandise to time payment purchasers. r instance, at the close of 1939 the Customers' Instalment counts balance of Montgomery Ward had reached the stagring sum of $82,606,060 while that of Sears, Roebuck and Co. ıounted to $77,957,220.

Another factor which is said to have augmented mail-order sales the maintenance of special booths in retail stores for the rpose of assisting customers in ordering mail-order items not rried in retail stock.

In the middle of the 1920s, the two largest mail-order houses, nmonly known as Sears' and Ward's, entered the retail store ld. This new activity was largely experimental until about 28, when the two companies, apparently believing that they d learned enough about retail store operation to justify considıble expansion in this field, opened retail units in a number of nmunities. By the end of 1940 Sears' were operating slightly der 600 stores, and Ward's in excess of 600. By this time, too, was clear that the original function of the two mail-order uses had been modified by the added function of acting as ɔbers to their own retail stores, whose sales it is estimated are ıning over 60% of total sales. (*See* also MARKETING; RETAIL LES.)

(J. G. ME.)

Maine, extreme northeastern state of the United States, admitted as a state in 1820 and popularly known as the "Pine Tree state," has an area of 33,040 sq.mi. Population (census 1940) 847,226, a gain of 6·2% for the decade. The capital is Augusta, 19,360; the largest city, Portland, 73,643.

History.—The *Bangor Daily News* carried further its 1939 attack on the state financial administration and claimed the credit for disclosures of irregularities and embezzlement after a private firm of auditors was hired to check up on the work of the state auditing department. On April 1, shortly before he was to testify to private auditors, William Runnells, state controller, was found shot. The auditors are reported to have discovered shortages in his accounts totalling more than $157,000. A sweeping investigation was subsequently carried out by a committee selected by a special session of the legislature.

SUMNER SEWALL, Republican governor of Maine, elected Sept. 9, 1940

Resignation of three high officials and the creation of a permanent legislative investigating and research committee, were results of the scandal. Committee reports disclosed widespread administrative inefficiency and disregard for the statutes. A defective administrative organization and the continuance of the spoils system appeared to be responsible for many of the difficulties, with public apathy and a one-party (Republican) system as contributing factors. Campaign charges of graft and inefficiency did not cause defeat of the well entrenched Republican party, although control was shifted from one faction to another. Senate president Sumner Sewall of Bath, member of an old shipbuilding family, aviator of the World War (1914–18) and businessman, was elected governor by a vote of 162,719 to 92,003 on a platform promising honesty, economy and efficiency in state affairs. In the same election (September), three Republican representatives and a senator were elected: James C. Oliver of Portland (1st district) re-elected, Margaret Smith of Skowhegan (2nd district) and Frank Fellows of Bangor (3rd district). Mrs. Smith had previously been selected at a special election to complete the term of Representative Clyde H. Smith, her deceased husband. Representative Ralph O. Brewster (3rd district) won the senate seat vacated by Senator Frederick Hale by defeating Governor Barrows in the June (Republican) primary. Fewer Democrats were elected to the state legislature than in 1938, but there was much new Republican blood, with over half of the house membership made up of "freshmen." An election surprise was the narrow Willkie margin of 163,951 to 156,478 votes over President Roosevelt in November, after the decisive Republican victory in September and large majorities for the Republican presidential candidates in 1932 and 1936. While Roosevelt carried all but Maine and Vermont in 1936, Maine was one of a few states where Roosevelt gained votes in 1940. The legislature met in special session in May, July and October, but passed no major bills. Several earthquakes were recorded late in the year, apparently centring in the neighbouring state of New Hampshire. A religious sect, Jehovah's Witnesses, was the victim of mob violence and property damage in several sections of the state. The disturbances culminated in the slaying of a deputy sheriff and the conviction of a Witness minister.

Education.—Maine continued to be low in its expenditures for rural schools compared with a majority of states. An annual "equalization fund" of $200,000 has been in effect since 1937 and together with other state and federal assistance has furnished some relief. Colby college carried on construction of buildings on its new campus. The University of Maine completed a dormitory for women and built a chemistry laboratory.

Charities and Correction.—The population of state institutions for criminals and mental patients increased slightly, with existing buildings inadequate.

Banking and Finance.—Bank deposits continued at high levels during 1939 and 1940. Interest rates were variable and somewhat higher than in Boston and New York.

Agriculture and Manufactures.—Maine's largest source of income, the tourist business, was estimated at $98,000,000, about the same as in 1939. Automobile registrations and gasoline taxes reached new high levels. Maine's potato crop for 1940 was estimated at 44,055,000 bu., an average yield, but larger than 1938 (39,600,000) or 1939 (37,260,000). The national crop in 1939 was 363,159,000 and as estimated for 1940, 397,722,000. The average Maine price per bushel for the 1939 crop was 74 cents; reports through November showed a 44-cent average for the 1940 crop, with large quantities being held and continued low prices in prospect due to above average national production. General business conditions in the state were better in 1940 than in 1939 or 1938 and near to the high figures of 1937. Most skilled and semiskilled workers found employment before the year ended. There was some migration of skilled labour, especially to other New England states. Maine textile and war industries began to feel a shortage of skilled workers as the year ended. Activity was lowest in September and October, with a vigorous rise thereafter, due to war orders. Bath and Kittery were active because of naval shipbuilding at the Bath Iron works and the Portsmouth navy yard, which is located at Kittery, Maine. Contracts were let for the building of 30 cargo ships for Britain, to be constructed at South Portland. Eighty men from Maine were inducted in the peacetime draft, national guard units were called to active service and defence airport construction hastened. Large numbers of unskilled workers remained unemployed and WPA rolls were only slightly below 1939 figures. (E. F. D.)

Maize: *see* CORN.

Malaya, British: *see* FEDERATED MALAY STATES; STRAITS SETTLEMENTS; UNFEDERATED MALAY STATES.

Malta: *see* BRITISH POSSESSIONS IN THE MEDITERRANEAN.

Manchoukuo (MANCHURIA), an empire, closely connected with Japan, located in northeastern Asia, bounded on the north and east by Siberia, on the west by Siberia, outer Mongolia and China proper, on the southeast by Korea. Its main outlet to the outside world is through the Kwantung leased territory, with its large port of Dairen, which is administered directly by Japan. The capital is Hsinking; the emperor, Kangte.

Area and Population.—The area is 460,383 sq.mi.; the population (Dec. 1937) 36,949,975, including 418,000 Japanese and 931,000 Koreans. Population of largest cities (June 1938): Mukden (772,017), Harbin (467,453), Hsinking (360,294), Antung (210,759).

History.—Manchuria formerly constituted the three northeastern provinces of China, Fengtien, Kirin and Heilungkiang. They were not under direct unrestricted Chinese sovereignty. Before the World War of 1914–18 Japan possessed extensive economic and extraterritorial rights in South Manchuria and Russia possessed somewhat similar rights in North Manchuria. Agents of commercial and general economic penetration of the two co tries were the Japanese-owned South Manchuria railway and Russian-financed Chinese Eastern railway. Chang Tso-lin his son and successor Chang Hsüeh-liang ruled Manchuria far as it was not under foreign influence as a virtually indepe ent principality, reckoning very little with the central governme Following a series of political and economic disputes, the Ja nese army overthrew the regime of Chang Hsüeh-liang in 193 32. Manchoukuo was proclaimed an independent state on Ma 9, 1932, and Henry Pu Yi, scion of the old Chinese Man dynasty, was declared emperor under the name of Kangte March 1, 1934. Japan quit the League of Nations because of league's condemnation of its action in Manchoukuo and several years Japan and El Salvador were the only powers wh recognized the new self-styled empire. In recent years Germa Italy and some of the smaller European states have accord recognition. The United States and Great Britain maint consular representatives who enjoy no official status but d with the Japanese and Manchoukuo authorities on an infor basis.

Education and Religion.—At the end of 1938 there were 1 866 primary schools in Manchoukuo, with 1,429,805 pupils; 1 high schools with 31,323 pupils; 8 colleges with 1,854 pupils normal college with 525 students; and 1 university with students. The principal religions were Confucianism, Buddhis Taoism, Lamaism and Mohammedanism. There were a lit less than 100,000 Christians in the country, of whom 64,2 were Roman Catholics and 32,192 were Protestants.

Armed Forces.—The strength of the Manchoukuo army given as 80,000 in 1940. The country maintained 11 gunboats a 4 other vessels for river and coastal guard duty. Much lar and better equipped than the Manchoukuo army was the Ja nese Kwantung army, the size of which was kept secret, a probably varied from time to time.

Finances and Banking.—The unit of currency, the Manch kuo yuan, was maintained at parity with the Japanese yen (va as of Dec. 15, 1940, 23.48 U.S. cents). The budget for the cal dar year 1939 was 403,377,000 yen, as compared with 304,555,0 yen in 1938 and 248,098,000 yen in 1937. At the end of 19 there were 85 banks in Manchoukuo, of which the two most i portant local banks were the Central Bank of Manchou, wh controls the note issue, and the Industrial Bank of Manchouk

Trade and Communications.—Manchoukuo's imports in 19 were valued at 1,505,011,000 yuan, while exports were 82 190,000 yuan. The corresponding figures for 1938 were 1,27 748,000 yuan and 725,454,000 yuan. Japan supplied about 83 of Manchoukuo's imports in 1939 and took about 62% of exports. Manchoukuo has over 6,000 mi. of railway lines, which over 2,000 were constructed after the creation of the n state. One of the most important of the new lines, from the ec nomic standpoint, gave Manchoukuo a sea outlet to the ea through the new port of Rashin, in north Korea. About 8,000 of new roads have been built since 1932. There were 13 comm cial air routes in Manchoukuo, with a total length of a little mo than 3,000 miles.

Agriculture, Natural Resources, Manufactures.—The so bean was Manchoukuo's staple crop and the country also p duced substantial quantities of kaoliang, millet, corn and whe and smaller quantities of rice, tobacco and cotton. Efforts introduce these last crops have met with an obstacle in t severity of the winter climate. In 1938 Manchoukuo produc 4,185,774,000 metric tons of soybeans, 4,152,406,000 tons kaoliang, 3,049,291 tons of millet, 2,440,535 tons of corn a 854,326 tons of wheat. Important natural resources are ir coal and timber. Reports of large gold deposits seem to ha

en exaggerated. Japan was pushing the industrial development Manchoukuo and Mukden and its environs became an outnding centre of heavy industry. Pronounced inflationary mptoms appeared in 1939. The note issue, for instance, rose om 426,000,000 yuan at the end of 1938 to 624,000,000 yuan the end of 1939. Government borrowings in the same period creased from 109,000,000 yuan to 390,000,000 yuan, while e commodity price index in the summer of 1940 was 85·5% gher than in the period before the beginning of the Sinopanese war. This situation led to some curtailment of productn and capital investment plans.

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andated Pacific Islands: *see* PACIFIC ISLANDS, MANTED.

andates. The 37th session of the mandates commission, which met in Dec. 1939, reported only on the uation in 1938. But it could not ignore the new situation ready created by the war, which involved the whole question of e status of territories under the mandate of belligerent powers ring war. The vicechairman, M. Rappard, summed up the uation. At least two states members of the League of Nations re then at war with Germany, and at the same time were adnistering as members of the league what were the former German colonies. The question arose whether the league was to be regarded as in the exclusive service of these powers at war or whether it exercised on behalf of the international community a supervision independent of national influences. For the future of the league, of international government and of the whole problem of colonial administration, this was a matter of vital importance. The mandates commission accordingly adopted a resolution asking the mandatory governments to forward information in the 1939 reports on their stewardship, which would help the commission to judge how far the belligerency of the mandatory powers was affecting the status and administration of the territories involved.

But in 1940 the course of the war disrupted normal events. The mandates commission was unable to hold a session. No 1939 reports could therefore be published. The plain fact, it was clear, was that certain mandated areas were automatically involved in a state of war: noticeably Palestine, Syria, Tanganyika. Light could not be thrown on the extent to which administration of these areas had been affected and the legal and international issues involved until the written reports of the responsible governments became available. (*See* also LEAGUE OF NATIONS.) (M. FE.)

Manganese. World manganese production in 1937 rose to a new record figure, estimated at 6,000,000 metric tons, but declined about 15% in 1938 and 6% in 1939, each based

Mandated Territories

Territory	Area	Date of Mandate	Mandatory Power	Former Title	Former Administration
outh-west Africa, including Caprivi Zipfel, formerly part of Bechuanaland protectorate	317,725 sq.mi.	Dec. 17, 1920	Union of South Africa	German South-west Africa	German Empire
ogo, comprising:		July 20, 1922		Togo	German Empire
(1) Togoland, i.e. western section, excluding the seaboard	13,040 sq.mi.		Great Britain		
(2) Togo, i.e. eastern section and seaboard	20,000 sq.mi.		France		
ameroons, comprising:		July 20, 1922		Kamerun	German Empire
(1) Cameroons adjoining Nigeria	34,081 sq.mi.		Great Britain		
(2) Cameroons adjoining French Equatorial Africa	161,200 sq.mi.		France		
anganyika	360,000 sq.mi.	July 20, 1922	Great Britain	German East Africa	German Empire
uanda-Urundi	21,200 sq.mi.		Belgium		
alestine	10,100 sq.mi.	Sept. 29, 1923	Great Britain	Palestine	Ottoman Empire
rans-Jordan	34,000 sq.mi.		Great Britain	Part of the Wilayat of Syria	
yria and Lebanon	77,700 sq.mi.		France	Syria	
ew Guinea, Territory of, comprising: (1) North-eastern New Guinea (i.e. the northern section of south-east New Guinea) (2) Bismarck Archipelago (New Britain, New Ireland, the Admiralty Isles, etc.) (3) Certain of the Solomon Islands (Bougainville, Buka, etc.)	93,000 sq.mi.	Dec. 17, 1920	Commonwealth of Australia	Kaiser Wilhelm's Land Bismarck Archipelago German Solomon Islands	German Empire
estern Samoa, comprising Savaii, Upolu, etc.	1,133 sq.mi.	Dec. 17, 1920	New Zealand	German Samoan Islands	German Empire
auru	8 sq.mi.	Dec. 17, 1920	British Empire, as represented by Great Britain, Australia, and New Zealand	Nauru	German Empire
acific Islands North of the Equator, comprising: (1) Marianne or Ladrone Islands (except Guam) (2) Caroline Islands, comprising the Eastern Carolines and Western Carolines, together with Yap Island and Pelew (3) Marshall Islands	811 sq.mi.	Dec. 17, 1920	Japan	No change	German Empire

on the preceding year. The status of the leading producers is shown in the accompanying table. The feature of the manganese industry in recent years has been the rapid rise of South Africa from a minor producer to third rank, following the soviet union and India; production in the first half of 1940 was 8% below the 1939 average, but exports were down only 6% and the third rank position apparently was lost to Gold Coast, where output in the first half was slightly higher. Brazil exported more ore in the first three-quarters than in all of 1939 and Cuba made a new record high, with shipments in 11 months 16% more than the former 1937 record and 49% above the 1939 total. The stocking program being carried on in the United States did not have much effect on output, shipments through Nov. 1940 having amounted to 36,500 long tons, against 29,300 tons in 1939. No production information is available from the soviet union, but both production and exports have been declining for several years.

The soviet union is the only important producer which is also a consumer on any appreciable scale and since production and consumption by other countries approximately balance, this means that, roughly speaking, the difference between the total output and the total consumer imports for any year is an approximate measure of the amount of the Russian output that has been retained within the country. Since 1934 this amount has been far in excess of any possible demand of the local steel industry, indicating that large amounts are being held in stock.

World Production and Imports of Manganese Ore
(In thousands of metric tons)

Output of Major Producers	1929	1932	1937	1938	1939
Brazil	316	20	253	222	193
Cuba	1	10	131	124	102
Egypt	191	..	186	153	120
Gold Coast	415	52	536	329	342
India	1,010	216	1,068	983	950?
South Africa	9	..	631	552	420
U.S.S.R.	1,415	832	2,752	2,273	?
Others	482	159	483	472	450?
Totals	3,840	1,289	6,040	5,100	4,800?
Imports of Major Consumers	**1929**	**1932**	**1937**	**1938**	**1939**
Belgium	329	154	340	196	100
France	801	349	492	319	(7)173*
Germany	390	107	554	426	(6)154*
Norway	161	20	131	124	104
United Kingdom	294	80	288	196	(8)181*
United States	671	92	927	491	637
Others	389	127	571	411	?
Totals	3,035	929	3,300	2,160	?
Difference	805	360	2,740	2,940	?

*The figure in parentheses was the number of months in the year for which import data were available.

Imports into the United States rose to a record figure in 1940, receipts in 11 months totalling 1,199,000 long tons, against a former high of 912,000 tons in 1937. A record steel output of over 60,000,000 tons would account for about two-thirds of the imports and the remainder went into either government or consumers' stocks. (*See* also METALLURGY.) (G. A. Ro.)

Manitoba, midcontinent province of Canada, the oldest and most easterly prairie province. Area, 246,512 sq.mi. (26,789 sq.mi. water); population (1939 est. dominion bureau of statistics), 727,000; urban, 44%. The 1936 census indicates British racial origin, 362,389; Ukrainian, 86,982; German, 52,450; French, 47,683; Polish, 35,136; Scandinavian, 21,504; Dutch, 25,521; others, 66,210. Total Canadian-born, 70%. Capital, Winnipeg, incorporated 1873; population (Nov. 1940), 223,735.

History.—The unicameral legislature of Manitoba consists 55 members, with a nonpartisan government representing Libera Progressive, Conservative, Co-operative Commonwealth Feder tion and Social Credit parties, headed by Hon. John Bracke premier since 1922.

The lieutenant governor is Hon. R. F. McWilliams, K.C., a pointed Nov. 1, 1940. Manitoba elects 17 members to the hou of commons and has six representatives in the Canadian senat

Education.—Public, elementary and secondary schools a maintained by general taxation, with the Manitoba university, i cluding a faculty of agriculture, and affiliated colleges (includin Brandon college) providing for higher education. There are als several other colleges and schools. Pupils in elementary grade 114,822; in secondary, 22,408. Full-time students enrolled university, 2,894.

Banking and Finance.—Winnipeg, financial centre of wester Canada, is western headquarters of 8 of the 12 Canadian bank and of insurance, mortgage and financial institutions.

Agricultural, Mineral, Manufacturing, Other Production.—A consolidation of all agricultural organizations in Manitob exists under the title Manitoba Farmers' federation.

Total gross value of agricultural production in Manitoba i 1939, $94,309,000; manufactures (1938), $131,770,280; miner production, $17,482,640; fisheries, $1,627,212; f.o.b. Winnipeg furs, wild catch, $1,352,598; fur farms, $629,793; processed i Winnipeg, $638,383; f.o.b. Winnipeg, including furs from othe provinces, $5,308,153.38.

Railways.—Canadian Pacific railway (Manitoba division mileage, single track, 1,897; double, 633; yards and sidings, 976 total, 3,506. Canadian National railway, single track, 2,448 double, 29; yards and sidings, 547; total, 3,024. Hudson Bay rai way, 510; Midland railway, 75; Greater Winnipeg Water distric 92.

Highways.—Surfaced, including trans-Canada, 8,734 mi. (grav elled, 8,228; bituminous, 489; concrete, 17). Government-owne telephone system has 73,383 telephones, 415 exchanges, total wir mileage 309,000, and operates two radio stations, one of 15,00 watts at Winnipeg and one of 1,000 watts at Brandon.

(J. L. J.)

Manly, John Matthews (1865–1940), professor emeritu University of Chicago, was bor in Sumter county, Ala., Sept. 2. He was educated at Furman an Harvard universities. He taught in the English department o Brown university from 1891 to 1898 and in the latter year be came head of the English department of the University of Chi cago, retiring in 1933. In 1909 he was an exchange professor a the University of Goettingen. He obtained a leave of absence fo the duration of the World War of 1914–18 when the United State began to participate in it and was assigned to the military intelli gence department. He wrote many books on English literatur and specialized in the study of Chaucer. He edited an edition o *The Text of the Canterbury Tales* in eight volumes in 193 He died in Tucson, Ariz., April 2.

Mannerheim Line: *see* EUROPEAN WAR; FINLAND.

Maple Sugar. Production of maple syrup increased in bot the U.S. and Canada in 1940; in the State 2,583,000 gal. in 1940 compared with 2,515,000 gal. in 1939, an in the dominion 2,755,200 gal. in 1940 and 2,302,000 gal. in 193 The United States produced 611,000 lb. of maple sugar in 194 and 760,000 in 1939; Canada, 3,437,500 lb. in 1940 and 2,900,20 in 1939. In the United States 10,111,000 trees were tapped i 1940 against 10,520,000 in 1939. Between 20,000,000 an

Maple Sugar Production by States and Provinces, 1940 and 1939

Maple Syrup	1940 gal.	1939 gal.
mont	1,044,000	916,000
w York	734,000	714,000
io	332,000	370,000
nsylvania	112,000	129,000
chigan	74,000	104,000
ssachusetts	56,000	61,000
w Hampshire	53,000	58,000
ine	50,000	33,000
ryland	24,000	25,000
ebec	1,810,400	2,211,000
ario	519,400	479,000
w Brunswick	16,800	8,800
va Scotia	8,000	4,000
Maple Sugar	**lb.**	**lb.**
mont	258,000	308,000
w York	212,000	290,000
ssachusetts	56,000	40,000
nsylvania	36,000	43,000
w Hampshire	21,000	26,000
chigan	12,000	17,000
o	11,000	9,000
ine	10,000	6,000
ryland	9,000	10,000
ebec	3,251,700	2,715,400
v Brunswick	94,100	82,400
ario	50,000	66,200
va Scotia	41,700	36,200

00,000 trees are tapped annually in Canada. About one-fourth anadian production is exported to the United States.

(S. O. R.)

rble and Granite. The production of marble in the United States in 1939 rose 39% to 700 short tons, valued at $6,305,000, 75% of which was ding stone and 25% monumental stone. Most of the crushed roken marble sold is waste from the dimension stone branch he industry; this increased by 20% in 1939, to 104,300 short , valued at $383,600. Canadian production of marble was ll, 14,100 short tons in 1939, a decline of 25% from 1938. rble production in Great Britain is not of commercial impor- e, most of the supply being imported.

ranite.—The United States production of granite as dimen- stone in 1939 increased by 9%, to 733,600 short tons, valued 9,838,000; 64% of this was building stone, 24% monumental e, 4% paving stone and 8% kerbing; production as crushed roken stone increased by 16% over 1938, to 11,308,000 short , valued at $12,658,000; 78% of the total was for concrete ag- ate or road metal, and 11% as railroad ballast; riprap, which stituted 46% of the 1936 total, was 10% in 1939. Canadian duction of granite increased by 55% in 1939, to 1,102,400 t tons, valued at $2,119,500. Production of granite in Great ain is reported along with other types of igneous rocks, in- sing in 1938 by 9% to 11,435,000 long tons, valued at 61,000; 86% of the total was used for road metal or ballast.

(G. A. Ro.)

rchesi, Blanche (Baronne Caccamisi) (1863–1940), opera singer, was born in Paris, April 863, of a German mother and Italian father. She began her sical career as a teacher at the age of 15, and her operatic er started when she sang Brunhild in *Die Walkuere* at the gue opera house in 1900. She appeared in France, Germany, land, Belgium, the British Indies and the United States, tour- the latter country twice. She received British and Belgian orations and wrote a volume of reminiscences, *A Singer's rimage*. She died in London, Dec. 15.

rgoliouth, David Samuel (1858–1940), British Ara- bic scholar, was born in don, Oct. 17, and died there, March 23. For a biographical ch see *Encyclopædia Britannica,* vol. 14, p. 879.

rijuana: *see* Chemistry; Psychiatry.

Marine Biology. A little over a year of war in Europe and a longer interval in the orient combined to deal crushing blows to productive effort in marine biology all over the world in 1940. The year witnessed one after another of the maritime countries of the European continent struck with such lightning-like rapidity that not only was the personnel of their marine institutions affected, but in many instances the physical plants and equipment were requisitioned or destroyed by ruthless invaders. A similar fate was met by the biological programs of both Britain and France. So critical in fact was the effect of the war on all scientific societies of Great Britain that an appeal was made for financial support of their scientific publications if they were not to be discontinued altogether. The advent of Italy in the war caused a cessation of marine work in Mediterranean countries and the sea closed to biological field work by blockade. Nor did the damage stop in Europe. Research problems formulated about the Pacific ocean, especially in Japan and in China, have long since ceased. Such worldwide conditions not only disrupted long range programs but discouraged and inhibited the advent of new ones. "Free science in America means free science for all the world," wrote a delegate from the University of Latvia (whose faculties were banished) to the joint celebration of the 200th anniversary of the founding of the University of Pennsylvania and the annual meeting of the National Academy of Science meeting in Philadelphia. Just how critical the situation became in international science may be inferred by a note in the *New York Times,* wherein the American Association of Scientific Workers offered to be the custodians of the research results of British scientists. This offer included the preservation not only of their papers, notes and manuscripts, but valuable books and important collections of specimens, technical apparatus and other appurtenances used in specific undertakings. Thus, for example, according to *Science,* a new "Plankton Recorder" was sent from the University college (Hull) to the Oceanographic institute at Woods Hole (Massachusetts) to be kept and used by the latter institution for the duration of the war. This instrument was perfected to record continuously plankton samples without the necessity of its removal from the water. It was to be installed by agreement upon the "Atlantis," but subsequent report came that the "Atlantis" and its newly-acquired sister ship the "Anton Dohrn," a 70-foot power boat, a gift of the Carnegie Institution of Washington, would find a more urgent sphere of usefulness in the national defence program of the United States.

Certain biological aspects of the sea's atmosphere over the Atlantic were studied by aeroplane in relation to the presence of ragweed and other pollens, fungus and mould-spores and other types of vegetation. The investigator found that by exposing sticky glass slides at intervals and at various altitudes to and from Bermuda an accurate index of the relative distribution of such organism was obtained. Ragweed pollen (one of the chief causes of hay fever) was present over Long Island and out to sea for a distance of some 80 miles. Over the open sea beyond, only mould and fungus spores were trapped in the sampling. In an attempt to discover the nutritive value of certain of the seaweeds (kelp and Irish moss) that grow in great abundance along both coasts of the western hemisphere, workers in the United States Fish and Wild Life laboratory fed graded percentages of these plants to experimental rat colonies. Diets containing up to approximately 10% kelp (agar) grew 20% faster than the controls, while on a diet of Irish moss the growth was but two-thirds that of the controls. It is assumed these studies have wide practical interest in human nutrition, since it is known that in some European countries as well as in Japan and China a considerable part of the human dietary consists of these marine plants.

The United States department of agriculture reported the suc-

cessful extraction of an insect-killing drug "rotenone" from a seashore plant known as the devil's shoestring. This accomplishment will augment the now diminishing supply of the drug chiefly imported from the Netherlands East Indies. According to the report the greatest quantity is yielded by the plant during the time of its blossoming.

The Academy of Science of the U.S.S.R. reported a taxonomic study of the ichthyfauna of the Laptev sea in the Arctic region in connection with other explorations. The report suggested that out of a total of 315 specimens taken, certain ones are typical Atlantic and others typical Pacific forms, while a few give evidence of interbreeding.

The icebreaker "Sedov" which returned to Murmansk in January 1940 after a remarkable drift of 27 months in the Arctic, again set out on an expedition sponsored by the geographical department of the U.S.S.R. This expedition is to sound and study currents, ascertain wind velocities, determine ice conditions and observe magnetic changes over a distance of some 200 mi. of the Kara sea from Izvestia Tsik islands to Russky island.

Because of its valuable vitamin A content of the liver, the shark assumed a prominent place in the fishing industry along the north Pacific coast. This product now stands second in potency as a source of vitamin A.

Referring to the Byrd expedition to Little America, it is interesting to record that on Sept. 27 President Roosevelt awarded a gold star to Rear Admiral Richard E. Byrd, retired, in recognition of his successful Antarctic explorations. Although Admiral Byrd returned to the United States, his party remained in Little America exploring the Antarctic continent and adjacent w in and around the Bay of Whales.

The American Association for the Advancement of Sci through a financial grant to the South Carolina Academy of ence, discovered that "mud-blister" on the oyster (*Ostrea ginica*) is caused by a tiny annelid worm *Polydora ciliata.* parasite infests approximately 30% of the oysters of the s Atlantic coast, so that its control is of considerable value to shellfish industry of the south.

A worker at the Scripps Institution of Oceanography, a Jolla, discovered reversible currents in ocean canyons 2,00 3,000 feet below the ocean surface off the coast of Califo Since these currents sweep in and out at irregular intervals e few hours, they are not related in periodicity to the tides and bear no tidal relationship. They are thought to be causec deep-sea eddies. A similar study of the sediments and geo of the Gulf of California was being sponsored by the Unive of California and the Geological Society of America, using research vessel the "E. W. Scripps" out of La Jolla.

One of the two Gobioid fishes new to science, collected on Roosevelt presidential cruise into the Caribbean sea in 1938, given the name of *Pycnomma roosevelti* in his honour. The sp men classified by a worker in the Smithsonian institute was ta in latitude 13° 21′ N. and longitude 81° 22′ W. off old Provid island. (*See* also OCEANOGRAPHY; ZOOLOGY.)

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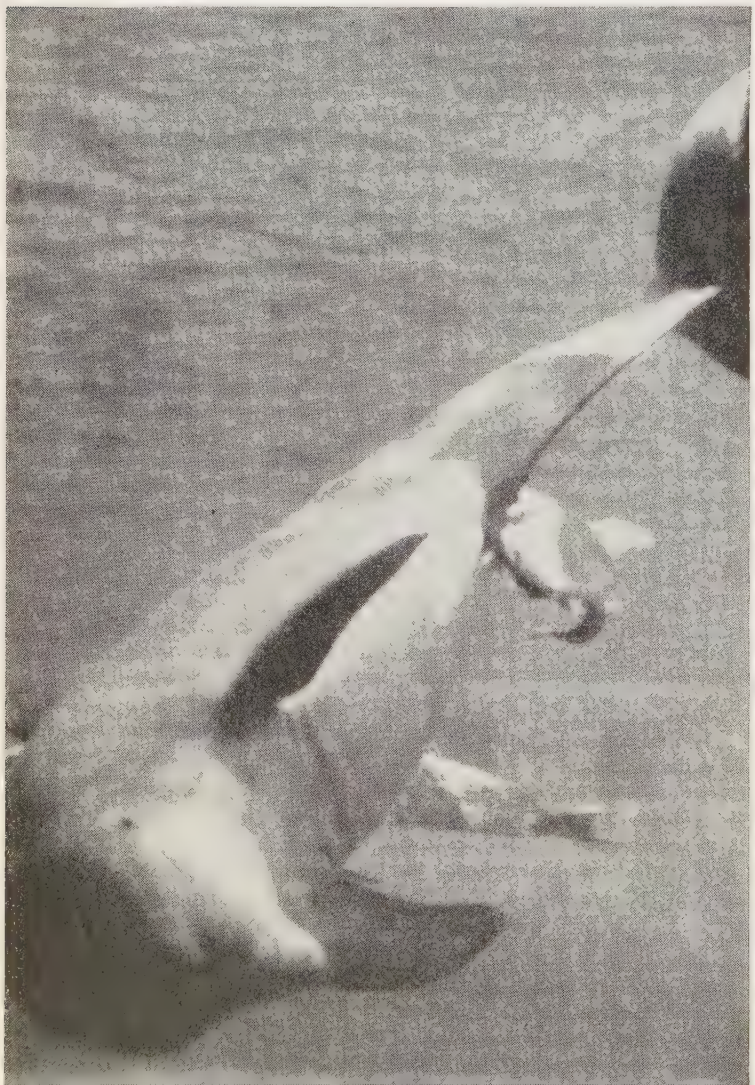
FIRST PORPOISE ever born in captivity, at Marineland, Fla., Feb. 14, 1940



Marine Corps, a military organization of all arms, is an tegral part of the U.S. navy, specially org ized and trained to meet the needs of the fleet afloat and ash Established by act of the Continental Congress Nov. 10, 1 present authorized strength is officers 1,600, enlisted 34,000. ganized reserves consist of officers 525, enlisted 5,800, nov active service. The commandant in 1940 was Major Gen Thomas Holcomb.

At sea, marine detachments serve aboard 57 battleships cruisers as part of the crew performing general duties and n ning some of the guns, total so employed: officers 140, enli 3,200. On shore, marines are stationed at navy yards and stat guarding these activities, there being 28 such posts within continental limits of the United States and 15 overseas p including a regiment on expeditionary duty at Shanghai, Ch and a battalion at the American embassy, Peiping, China. O overseas posts are at Hawaii, Guam, the Philippines and Vi Islands. Total at home shore stations: officers 134, enlisted 4, at overseas posts: officers 130, enlisted 3,000.

The fleet marine force (F.M.F.), strength, officers 500, enli 10,000, consisted in 1940 of 2 divisions made up of infan artillery, aviation squadrons, tank battalions, communicat companies and service troops, specially trained for landing op tions and to capture and defend bases required by the flee overseas operations. F.M.F. divisions are carried with the f when required in special transports and provided with spe boats for landing operations on hostile shores, and are statio for shore drills and training at bases at Quantico, Va., and Diego, Calif.

Aviation attached to F.M.F. divisions consists of 30 air sq rons based at Quantico, Va., San Diego, Calif. and St. Thom V.I.; strength, officers 360, enlisted 2,300, including rese

ers 130, enlisted 670. The aviation units also serve tours .rd aircraft carriers of the navy.

arine corps organized reserves, officers 525, enlisted 5,800, now on active duty under emergency conditions.

fficers are attached to 26 schools of the navy and the army special courses and enlisted men to 23 such schools.

fficers are commissioned from graduates of the Naval acad- and distinguished military colleges and from qualified en- d men. The ranks of officers and enlisted men correspond to e of the navy, but the titles are those of the army.

(D. Wi.).

rine Insurance: *see* INSURANCE, MARINE.

ket Gardening. Acreage of commercial vegetable crops grown for market in the United es in 1940 was 1,727,820 ac., slightly under the 1,785,150 ac. 939, but above the ten-year (1929–38) average of 1,612,240 Except for small temporary reductions the production of tables has increased steadily since 1918 in the United States. r cyclical trends and production of vegetables for processing TRUCK FARMING; also *see* LETTUCE; POTATOES; SWEET ATOES; TOMATOES.)

nited States production of the principal vegetables grown market, with acreage for 1940 and 1939, as given by the rtment of agriculture for 1940 (preliminary), 1939 and the ten-year (1929–38) average is shown in Table I.

le I.—*U. S. Yield and Acreage of Market Vegetables for Certain Periods*

	1940 acres	1939 acres	1940 production	1939 production	10-yr. av. production	Unit of measure
ichokes	10,600	10,200	848,000	1,122,000	875,000	40-lb. box
aragus*	80,080	73,170	7,673,000	6,907,000	5,382,000	24-lb. crate
a beans	13,150	13,750	913,000	1,100,000	714,000	32-lb. bu.
p beans	163,520	177,340	14,718,000	16,669,000	12,076,000	30-lb. bu.
ts	11,460	11,640	2,016,000	2,021,000	1,942,000	52-lb. bu.
bage	168,280	162,510	1,112,000	991,000	976,000	tons
taloupes	129,060	133,410	14,237,000	14,402,000	14,890,000	60-lb. crate
rots	46,100	43,520	17,843,000	16,061,000	12,560,000	50-lb. bu.
liflower	31,060	28,450	9,188,000	8,476,000	7,284,000	1½-bu. crate
ery	42,010	40,240	12,590,000	11,527,000	9,525,000	⅔-size crate
et corn†	25,000	26,000	140,000,000	114,400,000	116,020,000	ears
cumbers	41,770	43,770	4,525,000	4,656,000	4,171,000	48-lb. bu.
plant	3,650	4,500	670,000	1,092,000	822,000	33-lb. bu.
e‡	900	1,100	243,000	550,000	598,000	18-lb. bu.
tuce	154,820	171,420	24,301,000	24,070,000	19,536,000	70-lb. crate
ons	107,490	131,140	15,213,000	17,840,000	14,157,000	100-lb. sack
en peas	..	107,250	..	9,726,000	7,690,000	30-lb. bu.
en peppers	21,110	21,930	4,491,000	5,066,000	4,068,000	25-lb. bu.
nach	61,730	61,030	12,855,000	13,275,000	12,603,000	18-lb. bu.
natoes	204,020	210,055	23,404,000	24,728,000	19,584,000	53-lb. bu.
termelons	277,730	277,220	77,703,000	66,204,000	68,900,000	melons
rlic	3,900	4,300	182,000	193,000	157,000	100-lb. sack
permint for oil	30,930	28,670	867,000	835,000	874,000	lb.
llots	4,700	5,400	596,000	674,000	605,000	30-lb. bu.

lifornia only. †New Jersey only. ‡Virginia only.

here are about 650,000 commercial vegetable farmers in the ted States. Two new vegetables were announced in 1940. One a hybrid squash, produced at the Connecticut Agricultural ion. The other was a new watermelon weighing 2 to 5 lb. designed to fit the refrigerators of city apartment dwellers. average watermelon weighs 25 lb. and many growers cialize in producing melons of 45 lb. or better. The tiny melon produced by D. Stanley Brown of Blackville, S.C., after eriments beginning in 1933. Cuba is a chief source of fresh etable imports to the United States. Table II shows Cuban orts to the United States from Nov. 1939 to Sept. 1940 and from Nov. 1938 to Sept. 1939. (S. O. R.)

le II.—*Cuban Export of Fresh Vegetables to U. S., 1939–40 and 1938–39*

	1939–40 lb.	1938–39 lb.
matoes	77,989,000	44,337,000
gplant	6,495,000	5,438,000
ppers	6,639,000	1,851,000
ra	1,789,000	2,064,000
na beans	7,330,000	4,566,000
cumbers	2,515,000	2,414,000
tatoes	4,731,000	834,000
ners	2,393,000	586,000

MARY BETH HUGHES of motion pictures helped the U.S. marines in their enlistment drives of 1940

Marketing. The United States census of 1940, covering as it does the retail, wholesale and service trades for the year 1939, presented the best statement on the statistical importance of marketing in this country available. Retail sales in 1939 amounted to $42,023,818,000, an increase of 28% over the total sales of $32,791,212,000, but fell short of the total sales of $48,329,652,000 of 1929 by 13%. The number of retail stores in 1939, 1,770,404, however, topped the number of stores in 1929, 1,476,365, by 20%. The increase in the number of stores was not merely noteworthy in itself but also for the reason that it was nearly three times the total increase in population of 7·2% that occurred in the same period of time.

The most noteworthy gains in number of retail stores occurred among food stores, eating and drinking places, filling stations, fuel oil dealers and second-hand stores. Moderate gains were made by drugstores. Actual declines in number of stores occurred among general stores, general merchandise stores, apparel shops, furniture stores and lumber dealers. About half of the total increase in number of retailers was due to the 154,000 drinking places and liquor stores listed in 1939 that did not exist in 1929.

In the general merchandise group variety stores alone showed a marked increase, not only from 12,110 stores in 1929 to 16,945 stores in 1939, but also in its sales totalling nearly $1,000,000,000, an increase of 8% in dollar sales over 1929.

The wholesale trade of the United States also showed an increase from 168,820 up to 201,781 establishments in the ten-year

period ending in 1939. The percentage of increase in number of establishments, 20%, happened to be precisely the same as the increase in the number of retail concerns. Wholesaling, however, failed slightly to keep up with the trend of retail sales in the same period. The total sales for the wholesale trade of $55,112,468,000 for 1939 represented a loss of 18% under 1929 as against a loss of only 13% in total sales by the retail trade for the same period.

The excess of wholesale sales over retail sales noted above may be explained by the fact that there were in 1940 many wholesalers who conducted an export business, who made sales to other wholesalers and jobbers and still others who sold raw materials and other goods to industrial, commercial, institutional and professional users.

The substantial gains in numbers of establishments, as well as the maintenance of total sales for wholesalers since 1930, showed that the wholesaler-retailer system of distribution continued as the channel through which nearly three-fourths of all consumer goods reach the public. The various systems of retailing that purchased most of their goods directly from producers, including the department stores, mail-order houses and chain stores, apparently did but little more than hold their own either in numbers of stores or in volume of sales. The position of these institutions in the general system of distribution of goods was established and settled. Gains in numbers of units as well as in sales apparently depended on general gains in business enjoyed by all rather than by gains captured from other channels by competition.

Among the marketing institutions that have shown the most rapid development since 1930 may be mentioned the supermarkets, the department stores of the food trades; the "voluntary chains," groups of independent retailers tied to wholesale establishments by contracts; retailers' co-operatives and consumers' co-operatives. It appears that there are more retail establishments in the voluntary chains and retailers' co-operatives than there are units in the corporate chains. Consumers' co-operatives that have been important factors for more than a generation in several of the northern European countries, are negligible in the United States both in point of numbers of establishments and in volume of business. It is a significant matter, however, that the sales of consumers' co-operatives in the U.S. seem to have doubled since 1930.

Direct-to-consumer, or house-to-house selling, has always been and is still important in the sale of many commodities of common use, such as: milk, fresh fruits, vegetables and other food products, periodicals, books, articles of apparel and many other goods. House-to-house distribution in most lines rises and falls inversely to the rise and fall of business conditions. The numbers engaged in this field of selling tend to increase when general business conditions decline and, similarly, to fall when business conditions improve.

Especially noteworthy among the developments affecting the distribution of goods in the late 1930s was the introduction of vocational training for workers in the distributive trades. Under the provisions of the George-Deen Federal act of 1936 modest sums of money have been appropriated annually for the use of the various states, to be matched by similar state funds, in the employment of teachers to conduct practical instruction in the arts and knowledge needed by employees in the distributive trades. The number of retail employees enrolled in such classes during each of three years ending June 30, for which figures are available, are as follows: 1938—36,008; 1939—88,429, and 1940—127,695 students. (*See* also MAIL-ORDER BUSINESS; RETAIL SALES.)

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Markham, Edwin (1852–1940), U.S. poet and lecturer, born in Oregon City, Ore., April 23 died in Westerleigh, N.Y., March 7. For a biographical ske see *Encyclopædia Britannica,* vol. 14, p. 921.

Marler, Sir Herbert (Meredith) (1876–1940), Ca dian diplomat, born in Montreal, March 7, the son of William deM. Marler, p fessor of real estate law in McGill university. He was gra ated from McGill in 1898 and was associated with his father the practice of law until 1929 when he was appointed Canad minister to Japan, after having held various offices of respo bility at home. He remained in Japan until 1936 when he made minister to the United States, resigning on Sept. 11, 19 because of ill-health. He was created a Knight Commander St. Michael and St. George in 1935. He died in Montreal, Jan.

Marriage and Divorce. The social attitude of U.S. le ership which in recent years been expressed in emphasis upon constructive effort in the fi of marriage and the family was evident during 1940. There we however, two special trends that by their prominence dist guished the year 1940. The first of these resulted from international situation. The war which began in Europe in 19 by influencing the national policy, especially U.S. preparedn for possible war, led to an increase of marriages. This incre was popularly interpreted as an attempt to escape the dra Although this was undoubtedly one reason, due to a misund standing of the provisions of the draft law, it does not app to have been the only motive. The greater seriousness engende by the social situation in the thinking of many young peo who through desire for greater economic or other security w postponing marriage, led to a less regardful outlook and advancing of their wedding.

The second distinctive trend is not new but it was expres with unprecedented popular concern. There was a more wi spread recognition of the dysgenic aspects of population grow This appeared in a quantity of public discussion, in literature b popular and scientific, dealing with the problems of fertility a with the motivations that are leading individuals in the mid class and professional class, especially, to postpone parentho to attempt a childless family, or to have but one child. T idea of planned parenthood is passing out of the negative ph of popularizing birth control to the more positive program increasing births among one group while lessening them am another.

The New England conference on Tomorrow's Children at H vard university, which attracted widespread interest, featu panel discussions on "The Undeveloped Family," "The Over veloped Family," and "The Balanced Family." The Southern c ference on Tomorrow's Children which met at Chapel Hill, N also revealed this new emphasis in the planned family moveme

Most significant to the student of U.S. contemporary life the continuation in 1940 of the constructive trends in the soc religious and educational programs for the conserving of m riage and the family. Although interest in strengthening m riage and the family was evident in the discussions of ev conference dealing with social problems, the following meeti deserve special recognition: the Kalamazoo Conference on Fam Relations, held in February at Kalamazoo, Mich.; the San Di Conference on Family Relations at San Diego, Calif. in Mar

Conference on Marriage Problems and Instruction held at mons college, Boston, Mass. in March; the Iowa Conference Family Relations at Cedar Rapids in March; the Sixth Annual iference on the Conservation of Marriage and the Family held Chapel Hill, N.C., in April; the New York State Conference Marriage and the Family held in New York city in April; the ific Northwest regional conference at Seattle in May; the mid- t meeting of the National Conference on Family Relations at cinnati in May; the Michigan State Conference on Family Re- ons at East Lansing in July; the Southern California Confer- e on Family Relations at Los Angeles in July; the Rocky untain Conference on Marriage and the Family at the Univer- of Colorado in July; the Institute on Home Living at Ohio e university in July; the Conference on Education for Family at the University of Wyoming in July. The final session of White House Conference on Children in a Democracy, held Vashington in January, devoted 4 of its 11 sections to family and the child.

uring 1940 in answer to the demands of college youth, courses arriage were offered in colleges in various parts of the United es. Many colleges where such instruction was not given pro- d a course of lectures dealing with marriage and family prob- s. There was evidence that instruction in preparation for riage in institutions where it was already established was be- ing more practical, more factual in content and was more quately making use of the contributions of the natural sci- es. There was in 1940 a decided tendency toward including e practical consideration of marriage problems in courses on family of the more conventional sociological type. The same d appeared in the instruction in family relationships offered he departments of home economics. Interest in education for riage in the high school also was slowly developing. The *Year-* of the American Association of School Administrators, in s in 1940, which advocates education for family life, will un- tedly stimulate interest in preparation for marriage and the ily among U.S. teachers and school administrators.

uring the year 1940, provision for domestic counselling was eased by the Bureau of Marriage and Education for Social Family Relations, Inc. under the direction of Dr. Valeria H. ker, 54 West 53rd street, New York city; the first marriage nselling organization in the south, the Marriage and Family ncil, Inc., Gladys Hoagland Groves, director, Chapel Hill, ., with W. Clark Ellzey, 210 Cheyenne avenue, Colorado ngs, Colo., as its representative in the Rocky mountain area; Marriage Embassy under the direction of Arthur Henry sch, 4846 North Sheridan road, Chicago.

here was no notable legislation relating to divorce but the t to safeguard marriage by laws requiring prenatal and pre- riage examination for the discovery and treatment of infec-

Table I.—*States Requiring Pre-Marriage Physical Examination*
(As of March 1, 1940)

State	Party for whom examination is required	Condition for which examined*	State	Party for whom examination is required	Condition for which examined*
ama	Male	V	North Carolina	Both	E,I,T,V
fornia	Both	S	North Dakota	Both	S
rado	Both	S	Oregon	Both	A,D,E,F,G,I,S,V
necticut	Both	S	Pennsylvania	Both	S
ois	Both	V	Rhode Island	Both	G,S,T
ana	Both	S	South Dakota	Both	S
tucky	Both	V	Tennessee†	Both	V
isiana	Male	V	Texas	Male	V
higan	Both	S,C,G	Virginia‡	Both	S
Hampshire	Both	S	West Virginia	Both	S
Jersey	Both	S	Wisconsin	Both	S,V
York	Both	S	Wyoming	Male	V

de indicating diseases for which tests are made:
coholism (chronic) D Drug Addiction F Feeblemindedness I Insanity T Tuberculosis
ancroid E Epilepsy G Gonorrhoea S Syphilis V Venereal Disease
ffective July 1, 1941. ‡Effective August 1, 1940.

Table II.—*Legal Age of Marriage and Waiting Period Requirement in Each State*

State	Age: With Consent		Age: Without Consent		Waiting Period	
	Male	Female	Male	Female	Between Application and Licence	Between Licence and Ceremony
Alabama	17	14	21	18	..	.
Arizona	18	16	21	18	..	
Arkansas	17	14	21	18	..	
California	18	16	21	18	3 days	.
Colorado	18	18	21	18	..	..
Connecticut	16	16	21	18	5 days	..
Delaware	18	16	21	18	..	24 hours—96 hours if non-resident
Dist. of Columbia	18	16	21	18	3 days	..
Florida	18	16	21	21	..	..
Georgia	17	14	21	18	if applicants are under 21, 5 days	..
Idaho	14*	12*	18	18	..	..
Illinois	18	16	21	18	3 days	
Indiana	18	16	21	18	..	
Iowa	16	14	21	18	..	
Kansas	18	16	21	18	..	
	15†	12†	..	..	..	.
Kentucky	16	14	21	21	..	
Louisiana	18	16	21	21	..	
Maine	16	16	21	18	5 days	
	14†	12†	..	..	..	..
Maryland	18	16	21	18	48 hours	..
Massachusetts	18	16	21	18	5 days	.
	14†	12†	..	..	..	..
Michigan	18	16	18	18	5 days	.
Minnesota	18	16	21	18	5 days	..
		15†	..	..	..	.
Mississippi	14	12	21	18	5 days	
Missouri	15	15	21	18	..	..
Montana	18	16	21	18	..	..
Nebraska	18	16	21	21	..	..
Nevada	18	16	21	18	..	..
New Hampshire	14†	13†	20	18	5 days	..
New Jersey	18	18	21	18	48 hours	24 hours
	14†	12†	..	..	..	..
New Mexico	18	16	21	18	..	..
New York	16	16	21	18	72 hours	24 hours
		14†	..	..	..	..
North Carolina	16	14	18	18	..	..
North Dakota	18	15	21	18	..	..
Ohio	18	16	21	21	5 days	..
Oklahoma	18	16	21	18	..	..
Oregon	18	15	21	18	3 days	..
Pennsylvania	16	16	21	21	3 days	..
Rhode Island	18	16	21	21	..	5 days if woman is non-resident
South Carolina	18	14	18	18	..	..
South Dakota	18	15	21	18	..	..
Tennessee	16	16	21	21	3 days	..
Texas	16	14	21	18	..	..
Utah	16	14	21	18	..	..
Vermont	16	16	21	18	..	5 days
Virginia	17	15	21	21	..	..
Washington	14	15	21	18	3 days	..
West Virginia	18	16	21	21	3 days	..
Wisconsin	18	15	21	18	5 days	..
Wyoming	18	16	21	21	..	..

*No statute, so common law rule seems to prevail. †With permission of court.
Sources: *Martindale-Hubbell Law Directory*, vol. II; Chester G. Vernier, *American Family Laws*, vol. I.

tious venereal disease continued. The law of Pennsylvania which became effective May 17, 1940, was typical of this legislation. It provided that no marriage licence might be issued without the certificate of a duly licensed physician that the candidate had had within 30 days a physical examination and serological test and was found free from communicable syphilis. A premarriage examination law of a new type went into effect in Virginia. Both applicants must be examined for syphilis and advised of its results, but having the disease does not prevent their getting a licence. The law assumes that they will in case of infection postpone the wedding and take treatment. Twenty-four states in 1940 had premarital examination laws. Three of these were passed during 1940.

Domestic relations were not much disturbed by the national program of military preparedness including the draft legislation, but as this program went forward and the scale of its operation increased, one of its consequences would seem to be reflected in an increase of domestic instability such as was experienced during the war of 1914–18. It was reported that there was a great increase of prostitution in certain communities in the vicinity of army encampments.

A study of the practice of the various Protestant churches with regard to remarriage of divorced persons was being made by the

Committee on Marriage and the Home, of the Federal Council of the Churches of Christ in America. The most contentious issue that appeared at the 1940 general convention of the Episcopal Church of America was whether there should be a change in the prohibition of the marriage of a divorced person. The proposal that those remarrying after divorce be admitted to Holy Communion was vigorously supported but finally defeated.

(E. R. G.)

Marshall, George Catlett (1880–), U.S. army officer, was born at Uniontown, Pa. on Dec. 31. Commissioned second lieutenant of infantry Feb. 2, 1901 after completing his studies at Virginia Military institute and the Army Staff college he advanced through the grades to brigadier-general in 1936. In 1902 and 1903 he served in the Philippines, also from 1913 to 1916. He was with the American expeditionary forces to France in 1917, on the general staff of the first division, as chief of operations of the first army and as chief of staff of the eighth army corps. After the war he was aide-de-camp to Gen. John J. Pershing for five years. From 1924 to 1927 he was stationed in China; in 1933 he was appointed commander of the Eighth infantry and in 1936 commanding general of the fifth brigade. On April 27, 1939 President Roosevelt appointed him chief of staff of the U.S. army with the rank of full general. In this office, throughout 1940, it was his duty to direct and co-ordinate the enormous load of activity that attended the first peacetime military conscription in U.S. history. General Marshall was an early supporter of the Burke-Wadsworth selective service bill and was present at its signature by President Roosevelt on Sept. 16. He had declared a month previously that the United States, to defend the western hemisphere, needed an army of 3,000,000 or 4,000,000 men.

Martin, Joseph W., Jr. (1884–), U.S. legislator and leader of the Republican party, was born at North Attleboro, Mass. Nov. 3, the eldest son in a blacksmith's family of eight children. After graduation from high school he became a reporter for the Attleboro *Sun* and the Providence *Journal*. In 1908 he became publisher of the North Attleboro *Evening Chronicle*, and four years later he was a member of the Massachusetts house of representatives. From this first political office he moved to the state senate and later (1922–25) he was executive secretary of the Republican state committee. Elected to the U.S. house of representatives first in 1925, Martin became well known as a shrewd parliamentarian and political strategist. After being elected Republican leader of the house in 1939 he solidified the minority party into a formidable opposition to the New Deal. Wendell Willkie selected Martin as chairman of the Republican national committee July 9 to succeed John D. M. Hamilton. After the election of Nov. 5 Martin announced his intention to retire from the office.

Martinique: *see* French Colonial Empire.

Maryland, one of the original 13 states of the United States. Total area 12,300 sq.mi., land area 9,887 sq.mi. Population 1940 census 1,821,244, increase of 189,718 over 1930, 11·6% gain as compared with 7·2% increase for the U.S. Total urban population 1,080,351, rural population 740,893. Annapolis, capital, population (1940) 13,069; Baltimore, metropolis and seaport, population (1940) 859,100. Maryland has seven cities with populations of 10,000 or more. All increased during 1930–40. Eighteen of the 23 counties gained population. Greatest growth was in Montgomery county, which gained 70·5% as part of Washington, D.C. metropolitan area. Maryland ranks 28th in size but 12th in population gain. Population density, 184·2 inha tants per sq.mi.

State birth rate by residence for 1940 (11 months) was 1 (16·0 white, 21·0 Negro); for 1939 it was 16·7, 15·9 and 21·1 spectively. The death rate 1940 (11 months) was 12·2 (1 white, 16·1 Negro); for 1939, 11·5, 10·8 and 14·9 respectively. fant deaths per 1,000 live births for 1940 (11 months) were 4

History.—In the presidential election Roosevelt received 38 546 votes and Willkie, 269,544; the Socialist party, 3,967, Co munist, 1,216; Labor, 635. Seven constitutional amendments a two state referenda were voted on in November. Four ame ments and one referendum were approved. They provided fo People's court in Baltimore city and counties and an additio circuit judge; that salaries of judges and public officers be exempted from income taxes. A legislative act changing the St Industrial Accident commission was approved by referend and reorganization was announced.

Agreement was reached between the State Road commiss and Claiborne Annapolis ferry for the state to buy the bay fe line. Further legislative action was necessary.

Senator George L. Radcliffe was re-elected, defeating for Governor Harry W. Nice. Democrats won all six congressio seats. The governor elected in 1938 was Herbert R. O'Conor

Budget for the fiscal year ending Sept. 30, 1941 totalled $ 790,173: $21,800,430 from general funds, $27,844,505 fr special and debt service funds and $1,145,237 from federal ro funds. Federal contributions for schools, welfare programs, employment compensation, etc. raised the total federal funds $6,558,373, and $10,000,000 state unemployment compensat made total funds of $66,203,309 administered or controlled state agencies.

Roads and Bridges.—The $5,250,000 Potomac toll bridge c necting southern Maryland and Virginia was opened Dec. 19 Construction began Dec. 1938 under PWA grant, covering 4 of cost. The bridge is 2 mi. long, has 24-ft. roadway, 2 em gency footways, and 135-ft. clearance at high water. It is only bridge across the Potomac south of Washington and provide a by-pass around Washington. The Susquehanna bri at Havre de Grace and Perrysville on route 40 was opened A 1940. It cost $4,900,000, has 4 traffic lanes, is more than a r long, 7,618 ft. between abutments and will be 89 ft. ab mean low tide.

Education.—Average total enrolment in the public element and high schools (1939–40) was 297,031, of which 61,068 w Negro. There were 228,267 enrolled in elementary schools 68,764 in high schools and vocational schools. Catholic enrolm 1938–39 was 47,788, and other private schools 6,802. The s School Survey committee created by the legislature was gi $12,000 to make a comprehensive report on educational facili to the next session of the general assembly.

Banking and Finance.—State banks and trust compa (114) had resources (June 29, 1940) of $400,180,266 compa with $393,474,443 for Dec. 30, 1939; deposits $350,691,37 1940 and $344,825,735 in 1939. Mutual savings banks (12) June 29, 1940 had resources amounting to $256,024,708 deposits of $228,012,720 compared with $252,869,222 and $2 813,771 for 1939. National banks (63) had resources of $4 902,000 on June 29, 1940 and deposits of $411,055,000 as c pared with $420,180,000 and $387,285,000 respectively in 1

Agriculture, Minerals and Manufactures.—Total acreage all field and truck crops in 1940 was 1,679,200; 1,657,000 in 1 Farm crop value in 1940 was $46,759,000 and $45,163,000 in 1 The cash income from sales amounted to $65,702,000 for and federal subsidies were $2,203,000. Oyster production 1939–40 season was 3,129,270 bu. as compared with 2,136,94

the preceding season; hard crabs (1939) 246,967 bbl. and t crabs and pealers by number 12,924,276.

The total value of minerals mined in the state in 1938 was 407,723; coal mined was valued at $2,705,000 for 1,570,000 ıs. In 1939, 1,306,000 tons were mined. The value of manutures in 1939 was $1,027,354,074, a decrease of 6·25% from 1937 figures. Wages paid in 1939 were $156,782,654 as comed with $156,995,227 in 1937. Wage earners numbered 141,-3 (1939) as compared with 145,932 (1937).

Defence Program.—Allotments for the defence program in ıryland totalled $285,837,400 from July 1–Nov. 30, 1940, inding army and navy contracts, WPA defence programs and ence training. A $13,000,000 construction program to accomdate 26,000 men at Fort George G. Meade is scheduled for npletion by Feb. 1941. A Maryland Council of Defense and sources was organized in Aug. 1940, W. Frank Roberts, ıirman. (C. B. S.)

ısonic Order. **Antiquity.**—The year 1940 was marked by the publication, in England, (*A.Q.C. Trans.*, 5) of the "Graham Ms," presented before Quatuor Coronati esearch) Lodge No. 2076, London, with the statement that it "the most important document which we possess among the terial surviving for the student of Masonry from the 'ritual' nt of view" and "is so revolutionary in the way in which it cuts oss so many established notions that it may be a very long ıe before we are able to form any adequate judgment as to real position." The ms. bears the ambiguous date 1^{2}76 but ound to have been reprinted in part in another Masonic work olished in 1725. The ms. is claimed to have exploited, earlier n any other now extant, what is termed in Masonry the iramic Legend," which, therefore, "was known in the Craft its amplest form at least 21 years before the formation (1717) the Grand Lodge of England."

Discussion of the paper accompanying and analyzing the ms., veloped that it is (1) "an operative ritual," *i.e.*, actually used artisans of the builders' guilds from which modern Freesonry arose; (2) "an itinerary ritual," used by those who velled about; and (3), "a Christian ritual," for the "Masonry St. John" as distinguished from that of Melchizedek, to which ohammedans and other non-Christians adhered. The ms. is oduced in lithographed form in the publication above menned, together with a printed copy, the accompanying paper l comments of those members of the lodge who participated in discussion.

Jniversality.—The year's conquests of the totalitarian armies de serious inroads upon the order's ranks, those of Spain (*q.v.*), goslavia, France and The Netherlands having been the est victims. But in the democratic countries, despite (or perps because of) the war, Masonry flourishes. The Grand Lodge England, whose constituent bodies are found in many lands, maintained a rate of growth which makes it, according to a ent report, "the largest body of symbolic Freemasonry in the rld." Thus this mother Grand Lodge is the outstanding symbol Masonic universality. With a membership estimated at 450,-, and growing rapidly, it had, according to the latest available ırces, 5,056 subordinate lodges, distributed over most of the ilized world. Due to the exigencies of the European war, the emier Grand Lodge felt compelled to adopt, at its quarterly mmunication on March 6, the following resolution submitted the Board of General Purposes: "No brother being a national any state with which Great Britain is at war, shall attend or admitted to any Masonic meeting held under English constiion." And despite the dictators, King Gustavus V continued to Grand Master of Swedish Masons; King Christian X of the Danish; while the duke of Kent, brother of King George VI and Grand Master of English Masons, left his service at the front long enough to preside at the annual festival of the premier Grand Lodge on April 24. The nine provincial Grand Lodges of Canada, which are independent of the former, reported 168,951 members distributed among 1,379 subordinate lodges. In the United States, all of the major party nominees for president and vice-president were Masons, President Roosevelt being of the thirty-second degree and a Shriner, while three of his five appointees to the supreme court (Black, Reed and Douglas) are members of the order. The 50 American Grand Lodges reported 15,567 subordinate lodges and 2,489,587 members.

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Massachusetts, one of the thirteen original states of the United States, popularly known as the "Bay state"; area, 8,266 sq.mi.; population according to U.S. census of 1940, 4,316,721; capital, Boston, population according to U.S. census of 1940, 770,816. Of the state's population 89·4% live in cities and towns of more than 10,000 inhabitants. The 1930 census showed 4,192,926 whites, 52,365 Negro; native born, 3,194,978; foreign born, 1,054,636.

History.—The Republicans, led by Governor Leverett Saltonstall, completed in 1940 their second year in control of the executive department of the state after six years of Democratic rule. In Nov. 1940, Governor Saltonstall was re-elected. In the presidential election Roosevelt (Dem.) secured 1,076,522 votes; Willkie (Rep.) 939,700; Thomas (Soc.) 4,091; Browder (Com.) 3,806; Aiken (Soc. Labor) 1,492; Babson (Prohibitionist) 1,370. On Jan. 2, 1941, Gov. Saltonstall was inaugurated with the following elective officers of the commonwealth: lieutenant governor, Horace T. Cahill; secretary, Frederic W. Cook; treasurer, William E. Hurley; attorney general, Robert T. Bushnell; auditor, Thomas J. Buckley. The legislature, biennial, elected for two years, consists of a senate of 40 members, 25 Republicans and 15 Democrats and a house of 240 members, 143 Republicans and 97 Democrats. The combined legislature is known as the general court, a term dating back to the "General Court of Assistants," under the charter of the Massachusetts Bay company in 1630. No legislative session was held in 1940, under the biennial plan adopted in 1939. The 1941 session opened on Jan. 1.

Reporting on the changes during his first two years of administration, ending Dec. 31, 1940, Governor Saltonstall noted that, mainly because of substantial reduction of the state's tax burden on municipalities, 215 of the 351 cities and towns of the commonwealth had reduced their tax rates in 1940, the biggest general reduction in 30 years or more. Taxes on manufacturing industry in Massachusetts were reported to be the lowest of any of the leading industrial states. Industrial employment during the two-year period increased more than 10% and the total of industrial wages more than 20%. The two years, 1939 and 1940, brought a total of 681 new industrial concerns and concerns requiring substantial expansion.

State debt during the two years was cut $19,000,000, nearly one-half, the largest reduction in 40 years. Flood control work was completed by the state on 600 miles of streams in addition to the undertaking of two large flood control reservoirs in the Connecticut river drainage area by the federal government. In addition to flood control work, Quabbin reservoir, covering 39 sq.mi. and providing water supply for metropolitan Boston, had by Jan. 1, 1941 been completed. Also completed was the aqueduct from Quabbin to Wachusett reservoir, a distance of 24·61 miles and the second longest continuous tunnel in the world.

Hurricane damage of Sept. 1938 had largely been repaired—320,000,000 board feet of timber salvaged, representing a value of perhaps $3,500,000 to landowners.

Labour relations were good. Since 1937 Massachusetts had about the best record of lost time from strikes per number of people employed of all leading industrial states. National defence program found Massachusetts in the first line. The state has built up one of the largest national guards of any state in proportion to population and in providing armament equipment and supplies the commonwealth stood, in 1940, among the five leading states, as measured by government armament contracts awarded. At the 281 vocational schools in 85 different cities and towns of the state, more than 50,000 people were receiving training, much of which was directed to needs of the defence program.

Education.—According to the latest available statistics from the department of education (June 1940) the public day schools of Massachusetts had an enrolment of 700,305, with an average daily attendance of 629,550. This represented a slight decrease from the previous year. In addition, there were 26,480 pupils in the public evening schools and 1,274 in the public vacation schools. The total amount of money expended for the support of the public schools was $69,818,825.88, of which $50,259,949.78 was devoted to salaries and $759,573.78 to textbooks.

Under the law education is free. One of the greatest improvements in the laws affecting children came as a result of the passage of a bill which increased the school-leaving age for most children from 14 to 16 years. Massachusetts maintained a state college at Amherst, a state nautical school, a school of art in Boston, three textile schools and teachers' colleges at Bridgewater, Fitchburg, Framingham, Hyannis, Lowell, North Adams, Salem, Westfield and Worcester. In addition it supported a division of university extension, and a division of vocational education. It also awarded state scholarships to deserving students, who are children of World War veterans, in several private colleges and universities. In the year ending Nov. 30, 1939, the state teachers' colleges had an enrolment of 2,642 women and 635 men. The number of people registered for university extension courses was 34,457.

Massachusetts also has many important private institutions of higher education, among them Harvard, the oldest university in North America, Amherst, Williams, Massachusetts Institute of Technology, Clark, Boston college, Holy Cross, Boston university, Tufts, Northeastern and Worcester Polytechnical institute. Institutions for women include Emmanuel, Mount Holyoke, Radcliffe, Regis, Simmons, Smith, Wellesley and Wheaton colleges.

Charities and Correction.—Supervision of the state institutions is divided among several departments. The commission of Correction has charge of the state prison at Charlestown, the Massachusetts reformatory at Concord, the Reformatory for Women at Framingham, the State farm at Bridgewater and the Norfolk prison colony at Norfolk and supervision over the county houses of correction.

Under the jurisdiction of the department of Mental Health are state hospitals at Boston, Worcester, Taunton, Northampton, Danvers, Westborough, Medfield, Monson, Gardner, Waltham, Wrentham, Foxborough and Grafton, as well as the Boston Psychopathic hospital, the Belchertown State school and the Hospital Cottages for Children at Baldwinville. The department of Public Health supervises a number of sanatoriums.

Banking and Finance.—The state commissioner of banks had under his supervision as of Oct. 31, 1940, a total of 883 banking institutions, including 192 savings banks, 72 trust companies, 183 co-operative banks and 436 credit unions, besides a few private banks. On that date the institutions above listed had assets aggregating $4,719,763,233. According to the commission of administration and finance, the state's net direct debt the end of 1940 stood at $23,168,898.72. This represente decrease of $8,197,191.41 during the year. The leading sou of revenue were motor vehicle licences and gasoline taxes, $ 512,078.88; federal grants, $25,852,010.66; corporation and m cellaneous taxes, $13,731,024.40; assessments on cities and tow $16,000,000. Total receipts for the year were $124,817,539 Total expenditures, $123,200,427.88. The assessments noted w in part offset by a grant of $9,600,000 each year to municipali for highway improvement.

Agriculture, Manufactures, Mineral Production.—Dur 1940, according to the statistics of the United States departm of agriculture, the state raised: 9,281,000 lb. of tobacco, 325, bbl. of cranberries, 246,000 bu. of grain corn, 273,000 tons silage corn, 2,174,000 bu. of (commercial) apples, 594,000 tons hay and 238,000 bu. of oats. Total crop acreage for 1940 is e mated at 497,050 ac., an increase of 6,400 ac. from 1939. The p duction of milk in 1939 totalled 804,190,000 lb. Livestock farms in 1940 included 141,000 milk cows, 100,000 hogs and 7, head shorn sheep, which gave 42,000 lb. of wool in 1940.

With respect to manufactured goods, statistics for 1938 show the value of the state's leading products as follows: boots a shoes, rubber, $16,658,838; boots and shoes, other than rubb $132,964,607; paper boxes, $24,735,850; bread, $79,255,2 women's clothing, $43,987,205; cotton goods, $66,988,947; dye and finishing textiles, $47,900,883; electrical supplies, $92,2 000; foundry and machine-shop products, $63,703,683; leath $48,668,597; paper, $55,447,418; printing, $83,046,915; rub goods, $48,351,026; total $2,054,865,331. The number of indi trial establishments in the state in 1939 was 9,006, the aver number of wage-earners employed was 459,877 and the value manufactured products $2,457,599,210.

Fishing is still one of the state's leading industries. In twelve months ending Dec. 1, 1938, about 381,000,000 lb. of fi valued at $8,573,275, entered the ports of Boston and Glouces and were distributed therefrom. Total value of all kinds marine fish and shellfish landed in Massachusetts, $11,476,0

The chief mineral products and their 1936 values were: co $6,048,544; clay, $953,655; lime, $1,193,429; and stone $3,2 858. In 1939 sand and gravel to the value of $794,589 were tracted. (L. SL.

Massachusetts Institute of Technology.

While continuing its program of technological education and search as efficiently and uninterruptedly as possible, the ins tute was asked in 1940 to undertake a steadily increasing volu of work for national defence. Defence work is being conduct in a majority of its departments, mainly through contracts w the war and navy departments, the national advisory commit for aeronautics, the national defence research committee a national academy of sciences, and with private companies engag in development of equipment for defence purposes.

Members of the institute's staff are serving in a variety defence agencies, some having been granted leaves of absence a others having been relieved of a portion of their institute dut to enable them to serve. Special instructional work has a been undertaken or planned. In the summer of 1940, as a t program and to meet an immediate need for men, the instit offered without tuition charge a ten-weeks' intensive course train junior aeronautical engineers. Other courses of this ki are also being developed as a part of the federal program of sh intensive courses in engineering schools. The special training meteorology begun in the summer of 1940 for air corps cad is being continued, and the institute again has participated in t

ilian pilot training program.

The institute's operating budget for the year 1939–40 totalled ,333,000; the gifts received totalled $790,559; its educational nt assets stood at $16,328,000, an increase of $332,000 dur- the year; and the book value of its endowment funds totalled 5,012,773, a decrease of $217,000 during the year.

Enrolment for the academic year 1940–41 totalled 3,138, of ich 759 are graduate students, a further gain over 1939's high olment in the graduate school. Seventy per cent came from side Massachusetts, 63% from outside the New England tes, 34% from outside the North Atlantic states and 7% from side the U.S. There are 224 foreign students, from 46 foreign ntries. (K. T. C.)

ithematics. Mathematicians of the United States, under the direction of Professor Marston Morse as irman of the War Preparedness committee appointed by the nerican Mathematical society and the Mathematical Associa- n of America, launched a program in 1940 with three objec- es: (a) solution of research problems arising in the national ence program; (b) preparation of students for research on problems in (a); (c) solutions of problems relating to mathe- tical training for the services. In addition, the committee isted officials in placing mathematicians called into service in itions of maximum usefulness. Chief consultants, to direct earch on problems arising in the defence program, were ap- nted in the fields of ballistics, aeronautics, mechanical and ctrical aids to computation, industry, cryptanalysis, and proba- ty and statistics. The War Preparedness committee called a renaissance of the study of applied mathematics. In keeping h this appeal there was a symposium on aeronautics, dealing h mathematical problems in meteorology and in aeroplane ign and flight, at a meeting of the A.M.S. in Los Angeles Nov. 23.

Computing machines, capable of performing more and more nplicated mathematical operations and increasingly important applied mathematics and engineering, are being constructed in r greater numbers. Two will serve as samples of progress in o. The Bell Telephone laboratories developed a computing chine for multiplying and dividing complex numbers. It is structed largely of telephone relays and switches and is oper- d from a keyboard designed from a standard teletypewriter. ssachusetts Institute of Technology constructed a differential lyzer with 18 integrators.

The publication of mathematical journals throughout the world ered from war. The following was the situation in brief. and: nothing appeared, and it is unlikely that any of the for- r publications will continue. The Balkans: almost nothing was olished. Scandinavia: publication continued, but perhaps more wly. Italy and Russia: journals were published, but in great order, and it was difficult to obtain them. France: nothing eared after the armistice. Germany and Switzerland: all rnals were published and distributed regularly. England: olication was practically normal.

These conditions placed an added burden on mathematical olication in the U.S. Mathematicians are grateful to Duke versity for increasing the size of the *Duke Mathematical rnal.* A new series of lithoprinted monographs, the *Annals Mathematics Studies,* was established at Princeton university. l more mathematical publications were needed in the U.S.; as o ended, both the A.M.S. and the M.A.A. were attempting establish new series—a financially difficult task.

The publication of books also was normal in England and the . The following are representative of those published in Eng- d during 1940: *The Theory of Group Characters and Matrix presentations of Groups* by D. E. Littlewood; *Mathematical Papers: II. Dynamics* of Sir W. R. Hamilton; *Elementary Cryptanalysis: A Study of Ciphers and their Solution* by Gaines. Books published in America include *The Foundations of Geometry* by Robinson in the Mathematical Expositions series of the University of Toronto press; *Lattice Theory* by G. Birkhoff and *Gap and Density Theorems* by Levinson in the Colloquium Publications series of A.M.S.; three volumes in the series *Annals of Mathematics Studies; Advances and Applications of Mathematical Biology* by Rashevsky; *Mathematical Methods in Engineering* by von Kármán and Biot. Germany, formerly a great publisher of mathematical books, issued little more than second editions of old ones.

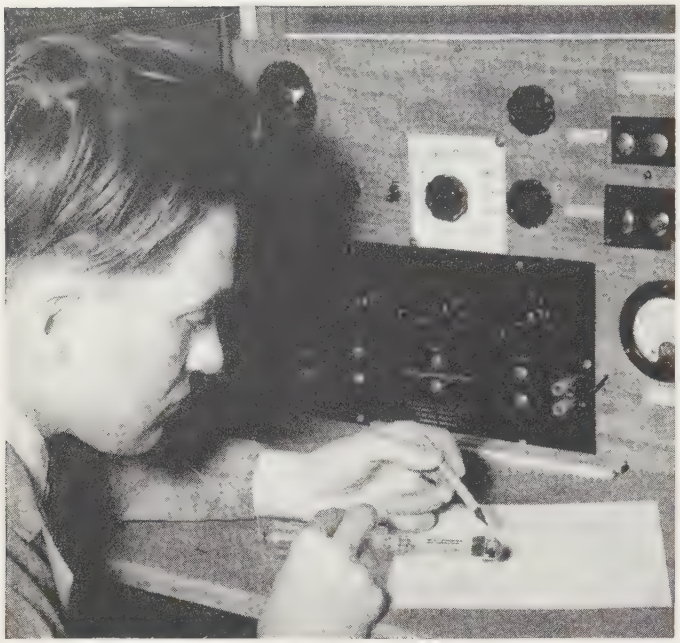
The dispersion of mathematicians from Europe continued. The new arrivals in the U.S. during 1940 brought the total number there to about 100; nearly three-fourths of them had been absorbed in the colleges and universities. It has been said that more of the leading German mathematicians were in 1940 in the U.S. than in Germany.

The year was fertile of new results in all fields of research; reviews of papers containing them can be found in *Mathematical Reviews,* vol. 1 (1940). Reviews of books and news items can be found in *Mathematical Gazette, Bulletin of the American Mathematical Society,* and *American Mathematical Monthly.* (G. B. P.)

Matter, Structure of. The most notable contributions in 1940 were to the knowledge of the nuclei of atoms and their properties. The process of nuclear "fission" was further investigated. This new phenomenon, whose discovery was one of the outstanding events of the year 1939, consists in the splitting up of the three heaviest elements—uranium, protoactinium, and thorium—into two different lighter elements as a result of neutron impact. During 1940 it was found that the fission of thorium and uranium could also be brought about by gamma rays and by deuteron impact. It was shown that the light rare isotope of uranium, U^{235}, was responsible for the fission usually observed with slow neutrons. The heavy isotope is affected only by fast neutrons. Uranium may absorb neutrons of intermediate velocity and transform into a transuranium element (number 93). This in turn changes into element 94, in which no radioactivity has as yet been observed. The existence of at least two chemical elements beyond uranium has thus been satisfactorily verified.

The question whether the atomic energy set free in the fission process can be made available by devising conditions under which the process once started would be self maintaining involves the quantitative study of many fundamental phenomena, about which there was in 1940 no adequate information. Considerable time will probably be required before the question of the possibility of developing atomic power in this manner can be decided.

Cosmic Rays.—In 1940 further information about the mesotron constituent of the cosmic rays was obtained. Its instability was demonstrated and its mean lifetime was determined to be approximately 2·8 millionths of a second. During the year a cloud chamber photograph was obtained which showed the actual transformation of a mesotron at the end of its life. A positron was formed with about half the energy, the rest of the energy presumably going into a neutrino. The mesotrons are produced in the upper atmosphere, probably by charged particles from outside the earth, whose nature is still unknown. In warm weather the atmosphere extends to high altitudes, and the mesotrons, being produced at greater distances from the earth, are consequently weaker at the earth's surface. Considerable progress was made during 1940 in analysing the complex effects due to cosmic rays at different altitudes, and attributing them to various processes: fast "knock-on" electrons are produced by mesotron



ONE OF SCIENCE'S most momentous discoveries came to light in 1940 when Dr. Alfred O. C. Nier, young physicist of the University of Minnesota, announced his success in isolating U-235, a radioactive derivative of uranium with an explosive force 30,000,000 times that of T.N.T. Dr. Nier in the photograph is pointing out a part of the spectrometer used to isolate U-235

impacts; "showers" of positrons and electrons are produced by photons or electrons resulting from the decay of mesotrons.

Isotopes.—During 1940 several attempts were made to separate the isotopes of various elements in considerable quantity; these met with much greater success than any previous attempts. The most striking was the separation of sufficient U^{235} from uranium to demonstrate that it is this isotope that is responsible for the phenomenon of fission produced by the absorption of slow neutrons. For this, 4·4 micrograms of uranium were separated into isotopes by the methods of mass spectroscopy in which the different atoms are deflected in a vacuum by a magnetic field.

Samples of carbon were prepared with an increased proportion of the heavy stable isotope at mass 13, which normally occurs only to the extent of 1% of the abundance of the main isotope at mass 12. By chemical means a five-gram sample was prepared containing 23% of carbon 13. Also an 8-gram sample of nitrogen was prepared with 70% of the heavy nitrogen isotope at mass 15 in place of the normal 0·4%. Such samples may be built up into hydrocarbons which are distinguished by their mass from the ordinary forms. These then may be used in biological experiments as tracers.

An interesting example of modern alchemy was the preparation of a sample of mercury containing only the isotope of mass 198 in place of the usual mixture of seven isotopes. This was prepared by the artificial transmutation of gold into mercury. A neutron was added to the gold, which then changed spontaneously by β-ray emission into mercury. A sufficient amount was prepared in this way to study the details of the spectrum.

Turning to new radioactive forms of the elements, a long-lived radioactive isotope of carbon of mass 14 was prepared. This form of carbon should be especially useful in biological investigations. Unfortunately, its radiation is not very penetrating, and requires special methods for its measurement. A radioactive form of the missing element 85 was prepared from bismuth and its chemical properties studied. This left only element 87 still unknown in 1940. A long-lived isotope of yttrium was prepared by bombarding strontium with deuterons, which emits gamma rays almost identical in penetrating power with those from radium.

Cyclotron.—During the year, work was commenced on "super" cyclotron much larger than any in operation and design to accelerate singly charged atoms up to potentials of 100,000,0 volts. Its construction will extend into a new range the kno principles of high frequency, high voltage, electrical engineeri and its successful completion will make possible a new range studies of atomic transformation. (*See* also PHYSICS.)

BIBLIOGRAPHY.—Papers on fission and mesotrons appeared in the *Ph ical Review*, vols. 57 and 58. For radioactive and stable isotopes, see same journal and the *Journal of Chemical Physics*. (A. J. D.

Matthews, Mark Allison (1867–1940), U.S. clergym noted as the pastor in Seatt Wash., of one of the largest Presbyterian churches in the wor was born in Calhoun, Ga., Sept. 24. He studied in Calho academy, began to preach at the age of 19 and was ordained wh he was 20. He served as pastor of churches in Georgia and T nessee until 1902 when he went to Seattle as pastor of the Fi Presbyterian church with 400 members, which under his leadersh grew to 7,500. He was admitted to the bar in 1900, but seld practised law. In Seattle he fought vice and political corrupti and brought about the conviction of the chief of police. He w elected moderator of the Presbyterian General assembly in 19 and later served as a member of its general council. He died Seattle, Feb. 5.

Maurice and Laura Falk Foundation, The: *see* FA FOUNDATION, THE MAURICE AND LAURA.

Mauritania: *see* FRENCH COLONIAL EMPIRE.

Mauritius: *see* BRITISH EAST AFRICA.

Mayo, Katherine (1867?–1940), U.S. author, was born Ridgeway, Pa., and was educated in p vate schools of Boston and Cambridge, Mass. She lived with h father, a mining engineer, in Dutch Guiana for eight years and h first published writings were descriptions of life in that part the world. In 1910 she collaborated with Oswald Garris Villard on his book *John Brown* and with Horace White on *Life of Lyman Trumbull*. In 1917 she published a book on t lack of police protection in the rural regions. Her most famo book, *Mother India*, was published in 1927. Two years earlier s had written *Isles of Fear*, an exposition of conditions in the Phil pines. She died in Bedford Hills, N.Y., Oct. 9.

Meat. Of somewhat larger interest in the meat industry's acti ties in the United States in 1940 was the augment trend toward processed meat foods—sausage, canned meat, slic bacon and meat loaves. The meat packers' year ends Sept. For the packing-house year ending Sept. 30, 1940, the volume processed meat foods broke all previous records.

Trade publications attributed the increased consumption to special advertising campaign sponsored by the American Me institute, formerly the Institute of American Meat Packers. unusually large number of hogs and cheap prices for pork a contributed. Table I shows the production of processed me foods at federal-inspected packing houses for the packers' ye ending in 1940 and 1939.

Slaughter of cattle, calves and sheep in the United States

Table I.—*U.S. Production of Processed Meat Foods, 1939 and 1940*

	1940 lb.	1939 lb.
All sausage	846,820,000	793,511,000
Fresh sausage	133,638,000	106,528,000
Smoked sausage	593,873,000	566,119,000
Dried sausage	119,310,000	110,864,000
All canned meats	721,244,000	581,392,000
Meat loaves	118,221,000	106,478,000
Sliced bacon	313,119,482	266,815,000

Table II.—*Slaughter of Meat Animals in U.S., 1939 and 1940 (10 mos.)*

	1940 head	1939 head
ogs	38,915,660	31,694,605
ıeep	14,468,471	14,383,531
attle	8,014,806	7,835,584

40 was at about the same level as in 1939, but there was a con-erable increase in the slaughter of hogs. Table II shows the ughter at federal-inspected plants for the first ten months of e calendar years of 1940 and 1939.

Disparity between beef and pork prices was unusually wide ring 1940, fat steers selling for twice as much per 100 lb. as gs. Imports of cattle and beef into the United States declined arply during the year. For the first nine months of 1940 im-rts of cattle and beef, on a dressed weight basis, were 259,-0,000 lb., a decline of 27% under the same period in 1939. these imports 125,000,000 lb. were from Canada and Mexico. the same period canned beef imported from South America alled 50,802,000 lb. compared to 69,656,000 lb. in the cor-ponding months of 1939. United States exports also declined astically from 60,099,000 lb. of cured pork exported the first ıe months of 1939 to 28,247,000 lb. exported in 1940. Lard ports for the same period in 1939 were 213,557,000 lb., but opped to 168,585,000 lb. in 1940. At the beginning of the new cking year, Oct. 1, 1940, United States stocks of lard were 2,259,000 lb. compared with a five-year average of 45,106,000 on that date. During 1940 the Federal Surplus Marketing ministration contracted to buy 130,740,000 lb. of lard and 0,699,000 lb. of pork. (S. O. R.)

edical Association, American: *see* AMERICAN MEDI-L ASSOCIATION.

edical Association, British: *see* BRITISH MEDICAL SOCIATION.

edicine. Outstanding among medical discoveries in 1940 were those related to chemotherapy, the vitamins d the glands. In the treatment of disease, first place was ld by the sulphonamide group of drugs. A new drug, called phanilylguanidine, was developed and found to be especially eful in relation to infections within the intestines. The drug is wly absorbed from the bowel and was, therefore, found to be ecially useful in the treatment of various forms of infectious sentery.

Many researches were concerned with an attempt to under-nd the manner of action, and it was agreed that the effect of ese drugs is not due to their ability to destroy germs, but to eir ability to prevent germ growth. New methods of application volved the combination of sulphanilamide and hyperthermia, ed in a cabinet, for the treatment of gonorrhoeal infections and dulant fever.

In prevention of infection in war wounds, sulphanilamide ayed directly on the wound was recommended and agencies re developing special devices for sprinkling sulphanilamide in s manner. Sulphanilamide was also fully established as the al treatment for trachoma and innumerable cases were pre-nted by this technique.

In the treatment of arthritis, preparations of gold were again ed, involving new salts and gold in larger dosages with indica-n of value in a limited number of cases.

Drs. Saphir and Howell announced the use of iodophthalein to minate typhoid germs from the bodies of those known as phoid carriers.

The most extraordinary technique suggested in 1940 was ex-sure of phosphorus to the cyclotron for the preparation of radioactive phosphorus which could then be suitably prepared for injection directly into the blood stream. This method was reported effective in lowering the number of white blood cells in cases of leukaemia. Radioactive strontium, similarly prepared, was used in the treatment of cancer.

In New York, experiments were made with the five-day treatment of syphilis, using slow intravenous injections of a preparation of mapharsen. Toxic effects indicate some danger in this method, but successful results are a promise for complete control in the future. Workers in Leland Stanford university developed a product called sobisminol for the oral treatment of syphilis in selected cases.

Investigators also suggested the use of curare, a poisonous substance from South America, for the treatment of Parkinson's disease, or shaking palsy. Apparently this is effective in a limited group of cases of different types, presumably those in which the palsy develops following encephalitis.

Special attention was given to the use of prostigmine for gangrene due to interference with circulation of the blood. Prostigmine acts on blood vessels to prevent spasms.

The release of histamine in the blood was found to be associated with headaches, with certain allergic disturbances and with Ménière's disease, a form of vertigo. Some investigators reported success in controlling such manifestations by desensitizing patients with a product derived from histamine, obtained from the intestines of the hog and called histaminase.

Complete studies dealing with fatigue indicated that gelatin cannot be depended on to overcome fatigue and that amphetamine or benzedrine will produce increased stimulation but not prevent fatigue. The League of Nations issued an official report concerning all of the different techniques developed for doping in order to encourage better performances from athletes and soldiers. A complete survey indicated that rest is the proper treatment for fatigue and that the only successful doping technique involves the use of cocaine and its derivatives, which, however, causes addiction and so is forbidden by law.

Vitamins.—New studies of the vitamins established fully the use of nicotinic acid as a preventive substance in pellagra, but Spies and his associates showed also that this deficiency is associated with a deficiency of the other portions of the vitamin B complex, including thiamin, riboflavin, pantothenic acid and pyridoxine, as well as a deficiency of vitamins A and C.

Vitamin K was found to be especially useful in increasing the prothrombin in the blood in new-born infants. Many obstetric clinics recommended injection of the mother with vitamin K previous to the birth of the child and injection of the child immediately following birth as a means of controlling to some extent haemorrhage in the brain during and after childbirth. Other obstetricians advocated improvement in care during childbirth and especially warned against the use of pituitary preparations which too greatly hasten childbirth and contribute largely to the cause of such haemorrhages.

New studies showed that a subacute deficiency of thiamin is common in the United States. An insufficient amount of pyridoxine or vitamin B_6 was found to be definitely related to nervousness, insomnia, irritability and weakness. The vitamin P, isolated by Szent-Györgyi, was reported by Kugelmass as useful for certain haemorrhages occurring in infants. It does not affect fibrinogen or blood platelets, but is valuable when the haemorrhages are due to weakness of the capillary blood vessels. Most of this effective vitamin P may be obtained from eating lemon peel.

Especially significant in vitamin studies were comparative experiments on vitamins necessary for the growth of germs in cultures and the manner in which germs may be modified by varying

the vitamin content of cultures. Various vitamins, including thiamin and particularly vitamin E (tocopherol), were found to be useful in preventing and controlling various disorders of the nervous system, such as amyotrophic lateral sclerosis. Other investigators reported vitamin B_1 as especially useful in the treatment of shaking palsy. These experiments were not, however, confirmed. Presumably the changes taking place in the tissues as a result of the nervous disorders are permanent and cannot be overcome by the administration of vitamins.

Nicotinic acid was found to be useful in the treatment of trench mouth among soldiers in Great Britain. Foxes fed on a diet of fish developed an inflammation of the brain known as encephalomyelitis. When they were returned to a meat diet or when they were given thiamin, this condition disappeared. Apparently the fox does not secure the necessary thiamin from a diet of fish.

Glands.—New hormones were isolated from the pituitary gland. A synthetic substitute for the female sex hormone, known as stilbestrol, was found to be useful for deficiencies of this hormone. These sex hormones, when administered in the presence of deficiency, improve the general condition of the tissues and so much improved the gums as to be recommended for use in pyorrhoea in women.

An extract from the adrenal gland cortex, known as cortin, was found to be useful in the treatment of cases of shock. The male sex hormone, when used in women following childbirth, was found capable of preventing the flow of milk, a technique desirable when for any reason the child is lost or the woman finds it undesirable to nurse the baby. The male sex hormone was used with success in some cases of pain during menstruation.

A substitute for the adrenal gland hormone, prepared synthetically, known as desoxycorticosterone, was tried in shock and for various conditions in which muscular weakness was a prominent symptom, this weakness being apparently due to a lack of the necessary hormone.

Most significant in this field of research was the determination of the presence in the kidney of a substance called renin, which reacts with a substance from the blood known as angiotonin to raise the blood pressure. A blood-pressure lowering hormone was also the subject of experiments. These experiments derived from the work of Goldblatt who tied off the circulation of the blood to the kidney and thus produced high blood pressure.

Cancer.—Outstanding investigations in cancer were developed by J. F. Mencke, who by feeding fat soluble material derived from cancers of the breast was able to produce tumours in sensitized mice.

P. E. Steiner of the University of Chicago prepared extracts from the livers of persons who had died from cancer which, on injection into mice, also produced cancer.

F. M. Allen suggested tying off blood vessels deep in the tissues to destroy the blood supply of cancers and to control their growth in the body.

Zinc peroxide was recommended for the clearing of the debris associated with chronic ulcers and cancer.

Mohs reported that zinc chloride, long used in cancer pastes, could be made the basis of a substance which would fix cancer tissue and permit surgical destruction under the microscope.

Investigations made on the so-called freezing or artificial hibernation in cancer indicated the method to be without practical value.

Surgery.—War medicine focused new attention on the Orr treatment for compound fractures, in which the limb is encased in a plaster cast. This method was much used by Trueta during the Spanish civil war and was in 1940 generally accepted as the ideal method of treatment for this condition.

Sidney Smith of the University of Chicago suggested the use of rods of sugar to fit blood vessels. These are coated with oil and used as a darning egg for sewing divided blood vessels together.

A. J. Cone of St. Louis recommended salt pork packs as means of controlling haemorrhage from the nose when of unknown origin or when occurring excessively during operation.

R. A. Griswold developed a new technique for fractures involving a double pin fixation of the bones.

Throughout the world it was established that blood plasma was valuable for shock, whether from wounds or from burns. The Red Cross engaged in a nation-wide effort to collect plasma for shipment to Great Britain. New devices were developed for drying plasma for use on naval vessels and for shipment.

In order to eliminate postoperative embolism or the travelling of blood clots from wounds to tissue near the heart or the brain, Drs. DeTakats and Jesser recommended raising the foot of the bed with the use of pedalling exercise.

L. A. Peer tried the cartilages from the ribs as material for repairing defects in the skull following injury and found them satisfactory.

In serious haemorrhages, Morrison and Samwick transfused blood directly into the bone marrow and reported successful results in some cases of leukaemia. This work is still in an early experimental stage.

Nervous System.—The hypothalamus was again the centre of interest, relating the emotions to thought and motor activity. The regularity of breathing, the constancy of the pulse, the maintenance of temperature, the intake and output of fluid, the cycle of sleep and all the periodic functions of the body are controlled through the hypothalamus.

Most prominent among nervous and mental conditions were shell shock and anxiety neuroses precipitated by the war. Nevertheless, the increase in mental disease was found to be less than one-fourth of one per cent per year.

Especially important was the work on infantile paralysis stimulated by the National Foundation for Infantile Paralysis. The funds made available through this organization have extended opportunity for experimentation with this disease. Fatigue of the muscles inclines toward greater paralysis when a child is infected.

The incubation period for equine encephalomyelitis was shown by F. C. Helwig to be 14 days in the case of a laboratory worker who was accidentally inoculated with this virus. A serum was developed and found useful in controlling this disease.

The use of electric shock was added to insulin and metrazol shock as a means of controlling mental disturbances.

New studies with the electro-encephalograph added new impressions regarding the nature of epilepsy.

Psychiatrists generally began to pay more attention to psychosomatic methods, in which bodily disturbances were related to mental disorders.

Investigators continued to study the surgical removal of small portions of the frontal lobes of the brain as a means of controlling certain depressive states.

Nutrition.—In addition to the work with the individual vitamins, a special study of spinach indicated that only 20% is available for the body and that spinach contains another radical known as oxylate radical, which has the disadvantage that it precipitates calcium into the body and carries it away.

Another investigator suggested seriously the eating of grass as a source of all vitamins, but the method was not generally adopted.

Great Britain recommended a bread fortified with thiamin and calcium for the majority of its public.

In the United States greater utilization of whole wheat bread was recommended and fortifying of bread with proteins, nicotin-

l, calcium, iron and phosphorus, according to the deficiencies various sections of the country.

'or diabetes, authorities recommended fasting and fat feeding, well as insulin injections, as a means of allowing the islands the pancreas to rest; in other words, to regenerate.

Biologic Preparations.—Specific serums for new forms of umonia were found and, combined with sulphonamide drugs, ded to lower death rates from pneumonia from 20% to 30%. . K. Knott suggested that a small amount of blood be with-wn from a vein in the arm, mixed with citrate solution, irradi-d with ultraviolet and reinjected into the body. The method not considered as established.

oseph Stokes developed a new vaccine for measles by raising virus of measles in the embryos of chickens within eggs. h vaccine was reported to be useful in lowering the incidence measles in an institution for children.

Horsfall, of the Rockefeller institute, utilized a similar tech-ue and was able to develop a vaccine against influenza by culating chick embryo with a mixture of distemper and influ-a, which will grow on this material. Human volunteers inocu-ed with the vaccine had their antibodies multiplied seventy-d. Subsequent inoculation with influenza virus seemed to show t they were protected against the disease.

An official report by a number of allergists indicates that the ing of extracts by mouth is not useful in the prevention of fever and asthma when it is a permanent sensitivity.

Skin Diseases.—Sensitivity to vinylite or elasti-glass wrist tch straps, garters and suspenders produced cases of dermatitis persons found to be especially sensitive. Innumerable cases skin sensitivity to the filler used in some forms of nylon siery were reported. Many men developed eruptions from the of dyed shorts and socks.

In the treatment of psoriasis, investigators tested the use of ssive doses of various vitamins and of many drugs, but with-t conclusive results.

Aviation Medicine.—Extended investigations in aviation medi-e indicated lack of oxygen, lack of warmth and perhaps the h altitude as important factors in causing accidents. New hniques were developed for supplying a mixture of oxygen and lium and for reduction of air pressure by use of closed cabins. w devices were developed for aiding inhalation of oxygen by ots. The Collier trophy was awarded to Harry S. Armstrong, alter Boothby and Randolph Lovelace for their investigations in is field.

Honours.—The distinguished service medal of the American edical association was conferred on Chevalier Jackson for his ntribution to the use of the bronchoscope for study of the ngs and for removal of foreign bodies. Dr. Frank Lahey of oston was elected president of the American Medical association. r. Irvin Abell was made chairman of the Co-ordinating Com-ittee for Health and Medicine in the campaign for war prepared-ss.

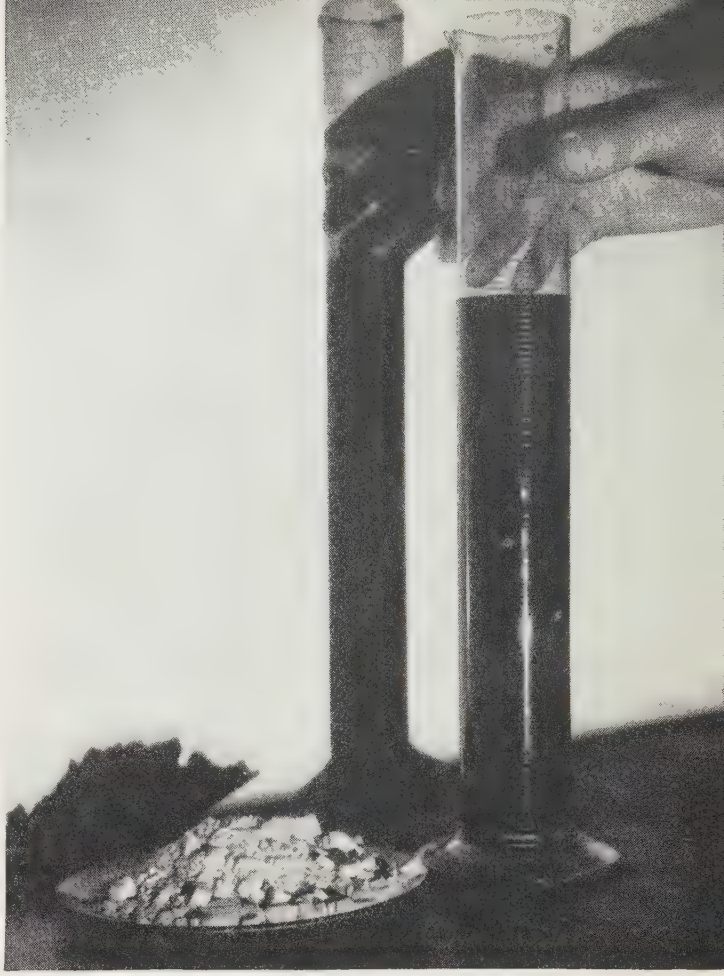
Literature.—Outstanding literary contributions were the auto-ographies of Hans Zinsser, J. H. J. Finney and Hugh Young.

Miscellaneous.—Marshall Jennison of the Massachusetts Insti-te of Technology photographed a sneeze, showing that every eeze spasm expels droplets 250th of an inch in diameter, heavy th millions of germs and with a muzzle velocity of 150 ft. a cond.

Isaac Starr of the University of Pennsylvania developed a bal-tocardiograph to measure the energy discharge of the heart.

The maternal death rate of the United States for 1938 was the west ever recorded in the United States. Infant death rate s lower in the U.S. than in Great Britain.

The number of physicians increased by 1,379 during 1939.



WAR'S ANCIENT MEDICAL PROBLEM of sufficient blood supplies for emergency transfusions was overcome in June 1940 by a group of Philadelphia physicians who perfected a method of transforming blood serum into a powder which can be stored indefinitely. After mixture with sterile water, the serum powder can be injected into a patient with any type of blood. The powder on the plate at the left in the picture is the equivalent of the 400 c.c. of blood in the flask

The Dionne quintuplets had their tonsils removed because they all had tonsillitis at the same time.

Most suggestive research of 1940 was the discovery that a metallic substance could be made radioactive, injected into the body and followed by use of the X-ray to its ultimate place in the body.

As the year 1940 ended, a new epidemic of influenza was spreading across the United States, and was found to be of a milder type and different strain than the serious epidemic of influenza in 1917–18. (*See* also ALLERGY; ANAESTHESIA; BACTERIOLOGY; BIOCHEMISTRY; BIRTH CONTROL; CHEMISTRY, APPLIED; CHEMOTHERAPY; DIETETICS; DRUGS AND DRUG TRAFFIC; ENDOCRINOLOGY; EPIDEMICS AND PUBLIC HEALTH CONTROL; GYNAECOLOGY AND OBSTETRICS; HOSPITALS; NERVOUS SYSTEM; PHYSIOLOGY; PSYCHIATRY; PUBLIC HEALTH SERVICES; SURGERY; UROLOGY; VETERINARY MEDICINE; VITAMINS; X-RAY. Also see articles on specific diseases.)

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Socialized Medicine.—State-wide or district voluntary insurance organizations for the collection of premiums from persons with modest or low incomes, to meet the cost of medical care, have been established in California, Utah, Michigan, Wisconsin, Pennsylvania, New York, New Jersey and the District of Columbia. Ten or more other state medical societies have been giving this subject careful consideration. These insurance arrangements sponsored by state medical societies are recognized as experiments. They are proceeding with the understanding that changes may be required as experience is gained. The period of operation has been too short, at this time, to express any opinion as to their success in supplementing the private practice of medicine.

The insurance principle has been used and was being urged in 1940 by other organizations either independently or in co-operation with medical societies. The Farm Security administration, department of agriculture, has sponsored a large number of local arrangements designed to enable the clients of the administration to meet with funds the minimum medical costs. As of Jan. 1939, medical societies in 30 states were co-operating with the Farm Security administration in the organization of medical care plans for low income farm families.

The state and district medical society insurance arrangements and the Farm Security administration plans are based on the use of fee schedules of approximately 50%, or slightly more, of the customary medical fees. Physicians who serve these insured persons are, therefore, making a very definite contribution to the success of these experiments.

From other sources there is urged a type of organization for the distribution of medical care under the name of "co-operative" or "group" medicine.

A study of 335 medical groups throughout the United States was completed by the bureau of medical economics of the American Medical association. Only 17 of the 335 groups reported that they were offering some general type of prepayment contract to the public to cover the cost of medical care. (R. G. L.)

Mediterranean, British Possessions in: *see* British Possessions in the Mediterranean.

Mental Diseases: *see* Psychiatry.

Mercury. World production of mercury is estimated at 4,600 metric tons in 1937 and 5,200 tons in 1938, as compared with the record high of 5,610 tons in 1929. The leading producers are Italy, Spain and the United States; over the past 25 years, the distribution of the output has been one-third each from Italy and Spain (with Italy slightly in the lead), and one-sixth from the United States, the remainder being divided among a large number of minor producers, the chief of which are Mexico and the soviet union. The recent distribution is not greatly different from this, except that Italy has taken a greater lead over Spain. Since the beginning of the war in Europe, data outside of North America are not available.

Italian production was 2,300 tons in 1938, but the rate declined somewhat in the first half of 1939. Spanish production has not been reported since 1935, but exports were about 1,450 tons in 1938. Sixty years ago the United States supplied two-thirds of the world total, but the highest figure in recent years was 860 tons in 1931, dropping to 330 tons in 1933, and increasing to 642 tons in 1939. As a result of war demand, the U.S. output expanded so rapidly that preliminary estimates indicate an outp of 1,240 tons in 1940, against a consumption of 920 tons; impo ceased early in the year with only 6 tons, while exports w reach about 350 tons. United States imports in 1939 were on 133 tons, 10% from Italy, 16% from Mexico and 74% fr Spain. Mexican output was 254 tons in 1939, against 293 tons 1938. British empire production of mercury is limited to abo 1 ton in Australia and New Zealand, but imports by the Uni Kingdom are heavy, the surplus of imports over re-exports be 1,035 tons in 1938, but only 33 tons in the first half of 19 German imports are still heavier, 1,132 tons in 1938 and 465 t in the first half of 1939. (G. A. Ro.)

Merit System: *see* Civil Service.

Mesotrons: *see* Matter, Structure of; Physics.

Metallurgy. The depression intensified the efforts to modi old processes and develop new ones which cou continue to compete under the constantly lowering prices th then prevailed; in view of the coming years of intensified a tivity in connection with the defence program, one may anticipa similar efforts with the object of increasing production witho unduly increasing the costs.

Alloys.—A new magnetic alloy (Vicalloy), containing 30–52 iron, 36–62% cobalt and 6–16% vanadium is said to be capable retaining a higher degree of permanent magnetism than any oth commercial material.

The researches of the U.S. bureau of mines on the utilizati of electrolytic manganese have led to the development of copper-manganese alloy which, when properly heat treated, h the strength and elasticity of mild steel, and a capacity for a sorbing noise vibrations that approaches that of rubber; it being tried out in noiseless gears and other types of use whe the suppression of noise is desirable.

An alloy of electrolytic manganese with 2% copper and 1 nickel has ductility and other properties similar to copper, b can be heat treated to produce an electrical resistance 1,000 tim that of copper. Another combination of the same metals has wide range of hardenability, which can be so controlled that t inside of the metal may be as soft as copper, while the outsi is hard as steel.

Casting.—A method was developed for the continuous castin of rods by allowing the liquid metal to flow from a containin reservoir through a tube which is cooled by an accurately co trolled water spray. Used for the production of wire rods, th not only eliminates the rolling of the ingots into rods, but giv a superior product through the avoidance of segregation, blo holes and other flaws inherent in ingot castings.

Superfinish.—While much attention was given to superfinis especially as a treatment for bearing surfaces, this procedu was new only in its application to commercial products, the sam principles being involved as had been used for the polishing metallographic specimens.

Hardening.—The localized hardening of steel surfaces by flam hardening or by localized electric induction heating is expandin in its applications.

Grossman and Stephenson reported that the greater the harde ability of a steel, as determined by its chemical compositio the more the hardenability is affected by changes in grain size hardenability can be increased as much as 50% by increasing th grain size.

Powder Metallurgy.—Starting only a few years ago with th consolidation of a metal powder by pressure and heat, there de veloped a well-established and rapidly-growing practice of powde metallurgy that has extended to the synthesis of a wide variet

ferrous and nonferrous alloys from the component metals in wder form. The resulting products have increased in size and nplexity of form, and have expanded in range of composition l scope of application as the technique of production has ogressed, until it seemed in 1940 that powder metallurgy was stined to take its place alongside diecasting as a simplifier of ny metallurgical problems.

Progress was hampered in 1940 by the fact that much of the tal powder used has been of European origin, and future deopment will depend to some extent on the success with which interrupted foreign supplies can be replaced with satisfactory nestic powders.

Beryllium.—The master alloy with copper, containing 4% Be, form in which the metal is most used, was in 1940 quoted at 5 per pound of contained Be, and was available in the form of l, strip, wire and tubing, as well as in ingots. A new developnt in the use of beryllium was in the setting of diamonds in e bits and reaming shells.

Chromium.—The U.S. bureau of mines reported on experimen- work done on the smelting of domestic chrome ores in the ctric furnace, and on the possibility of using domestic ores in e production of chromium salts.

Copper.—During the year 1940 there appeared on the market new type of commercial high purity copper. Bar, rod, strip and er commercial shapes of high density and exceptional ductility d malleability were produced by methods similar to those of wder metallurgy, by the heating and compression of broken ctrolytic cathode sheets, followed by extrusion in the desired ction. (*See* also COPPER.)

Magnesium.—A plant was being erected at Freeport, Tex., for e production of 6,000 tons of magnesium annually from sea ter in which the metal is present only to the extent of 0.1%.

Manganese.—The expansion of the electrolytic process for the covery of pure manganese from low grade ores from the pilot nt stage to commercial operation met with many difficulties, d was proceeding more slowly than had been anticipated. Durg the year ending July 1940 the plant capacity was raised tenld, to about one ton daily, and to raise this to 50–100 tons ily will probably take another year or two. For discussion of e utilization of the product, *see* above, under *Alloys*.

Tin.—Plans were under way to erect a tin smelter and refinery the United States as a part of the defence program. Work ong this line had already been started on a small scale in 1939 two commercial plants. The Metals Reserve company, an ency of the Reconstruction Finance corporation, closed a fivear contract with Bolivian producers, covering the purchase of ncentrates containing 18,000 tons of tin annually, to cover e ore supply for a plant to be erected as a defence project, t operated under lease by one of the established smelting comnies. (G. A. Ro.)

Metal Prices and Production: *see* MINERAL AND METAL PRICES AND PRODUCTION.

Metaxas, John (1871–1941), Greek statesman, was born on the island of Ithaca. In his youth he udied military tactics in Germany, then returned to his country serve in the Turkish war of 1897 and the Balkan wars of 912–13. After the World War of 1914–18 he was elected leader the Free Opinion party and became minister of communicaons in 1926. In 1935 Metaxas was again in the cabinet as inister of state. The following year he became prime minister. n Aug. 4, 1936, after King George had suspended the constituon, Metaxas assumed dictatorial powers. On July 30, 1938, e government made him "prime minister for life." When Italy issued its ultimatum to Greece on the morning of Oct. 28, 1940, Metaxas speedily rejected the fascist demands and ordered his countrymen to fight. This they did with such notable success that the military capabilities of Metaxas and his army chief, Gen. Papagos, became almost proverbial. But in the midst of their military triumphs Metaxas was stricken with a fatal illness and died at Athens Jan. 29, 1941.

Meteorology. The weather of the year 1940 in the United States was characterized by moderately subnormal temperatures over the eastern half of the country and abnormal warmth over the western half, with more than the usual amount of precipitation and cloudiness. One month, January, had outstandingly subnormal temperatures in the east and the summer was much warmer than usual in the midwest and far west, but otherwise moderate temperatures prevailed. January was the coldest month of record in the south with very heavy frost damage in Florida, and considerable damage in other southeastern states. Florida had the most severe freeze in 25 years, resulting in a nearly total loss of growing truck crops amounting to more than $20,000,000. The month brought heavy snow to the central states, with substantial falls in parts of the deep south, reaching eight inches in northern Louisiana. Following the January cold, the remainder of the winter had mild temperatures.

Spring was relatively cold in the eastern half of the United States and abnormally warm in the west. Mostly heavy precipitation occurred and generous rains in the winter wheat belt resulted in a remarkable recovery of the wheat crop from the extremely poor condition of the preceding autumn.

The summer had mostly moderate temperatures in the east, but they were outstandingly high in the western states where some areas had one of the warmest summers of record. Moisture conditions were mostly favourable for crop growth. However, midautumn brought a severe and abnormally early freeze to the southeastern states and tender truck crops were extensively damaged everywhere north of the Florida Everglades. In contrast to the preceding autumn, precipitation was heavy, which made conditions unusually favourable for seeding, germination and growth of winter grains. Wheat entered the winter in better than normal condition.

For the year as a whole, the temperature averaged below normal rather generally in the eastern states and decidedly above normal over the western half of the country, the greatest plus departures from normal appearing in the northwest, the western slope of the Rocky mountains and the Great Basin, where the annual average was as much as 4° above normal. The highest temperature reported for the year was 124° at Greenland ranch (Death valley), Calif., on Aug. 11, and the lowest 47° below zero at Fraser, Colo., on Jan. 19.

Precipitation.—Louisiana, with 74.6 inches of rainfall, or 134% of normal, was the wettest state in 1940; the second wettest, Mississippi, had 60.6 inches, or 114% of normal. The driest state was Nevada with an average of 10.9 inches, but this was 24% above normal; the second driest, Wyoming, 14.4 inches, slightly above normal. As related to the normal, California, with 156%, was the wettest state in 1940; and Nebraska, 74%, the driest.

California had the wettest year since 1909 and the third wettest of record; Nevada had the second wettest since 1913; Arizona the wettest since 1931; Utah the second wettest since 1927, and Idaho the wettest since 1927 and the third wettest of record. On the other hand, Nebraska had the fifth driest year in nearly half a century, while Illinois was the driest since 1930 and the fourth driest in 50 years. For the country as a whole the average precipitation for the year was 30.3 inches, exactly the

same as that for 1937, but not exceeded since 1927. The normal precipitation for the United States is 29 inches.

There was less than the usual amount of sunshine, the deficiencies being unusually large in the Gulf states, the far southwest and much of the Lake region, where some localities had from 200 to 400 fewer than the normal number of hours of sunshine. In relatively small areas, including the southern Ohio valley, the extreme northeast, the lower Great Plains and some northwestern sections there was more sunshine than occurs in a normal year.

Miscellaneous.—While fewer than the average number of tornadoes were reported, there were two outstandingly destructive storms: The first occurred at Albany, Ga., on Feb. 10, killing 17 people and causing property damage of about $10,000,000; the second at Shreveport, La., one month later, resulting in 13 deaths. As usual, there were many destructive hailstorms. July 8 hail in several Iowa counties destroyed crops to the va of nearly $500,000 and on July 13 about the same amount loss occurred in Montana.

A tropical hurricane visited southern Louisiana on Aug. 6 causing property loss of nearly $6,000,000. Some stations ported more than 35 inches of rain in four days, causing structive floods which drowned some 25,000 cattle, 2,000 hor and mules and 20,000 hogs. About the middle of August dama ing floods occurred in Virginia and on Sept. 1 southern New Jer suffered flood losses of nearly $1,000,000. (F. W. Rr.)

Other Countries.—The values for monthly rainfall a monthly mean temperatures given in the accompany tables referring to countries outside the United States provisional and may in some cases require a small corr tion. On account of war con tions it has not been possi to give complete data for so of the stations. Gaps in t tables indicate that the da could not be obtained.

General Notes on t Weather of 1940.—The ea months of the year were tremely cold over central a western Europe. The freezing the Baltic sea, which had co menced in Dec. 1939, becam progressively more severe, a ice seriously impeded navig tion up to the end of the thi week in January. Heavy i was also prevalent in the rive Scheldt and Maas during t first half of January. All na gation on the river Danu was stopped by ice on Jan. and only on Jan. 18 were ic breakers able to resume wo The Black sea was frozen Odessa. The week end begi ning Friday, Jan. 26, brou heavy ice storms and a reco snowstorm in the British Isle The damage to trees, telegra wires and telegraph poles w great and widespread. rather unusual phenomenon, sudden heavy fall of har clear ice-crystals, with no a companying precipitation any other form, was observe at a number of places in north ern England. The crysta were in some cases as much a 4 millimetres in length, with hexagonal base and clearly d fined edges.

The summer was warm an dry over a large part of centr and western Europe, Augu being the driest August f over a century. Severe drough persisted almost throughou Australia for many months, r

Table I.—*Monthly and Annual Mean Temperature and Extremes in °F. 1940, in Cities of the United States*

Cities	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	An. Dept.	High-est	Low-est
Albuquerque, N.M.	35.2	39.2	49.0	54.4	65.5	73.4	78.2	74.2	68.4	58.8	41.4	39.2	56.4	+1.1	98	13
Bismarck, N.D.	2.2	16.0	26.6	39.1	55.6	64.4	73.5	69.9	64.4	50.9	22.6	22.0	42.3	+1.8	99	−26
Buffalo, N.Y.	18.1	25.0	27.0	40.2	53.0	63.0	69.6	69.6	61.0	49.0	39.2	32.8	45.6	−1.4	91	− 3
Charleston, S.C.	40.0	48.8	55.0	62.6	70.2	80.8	81.4	80.7	74.9	66.6	59.0	55.0	64.6	−1.4	100	19
Chicago, Ill.	16.2	29.2	32.2	44.6	54.1	67.4	74.2	72.0	64.6	57.4	38.6	33.5	48.6	−0.5	101	−14
Del Rio, Tex.	52.3	54.4	63.7	69.2	75.4	79.4	83.9	82.8	78.0	70.8	57.5	55.4	68.6	−1.0	101	19
Helena, Mont.	15.4	26.6	39.6	42.4	57.1	63.9	70.4	69.9	60.4	49.4	23.0	28.7	45.6	+2.3	103	−17
Houston, Tex.	43.1	54.6	63.4	67.9	75.0	80.2	83.4	83.4	77.6	71.9	61.6	58.2	68.4	−0.7	99	10
Knoxville, Tenn.	26.7	40.2	47.2	57.8	65.4	75.6	77.0	77.4	69.6	61.3	48.6	46.2	57.8	−0.6	97	− 3
Los Angeles, Calif.	54.6	55.5	57.5	59.4	62.2	66.4	70.2	71.1	69.0	65.3	60.9	56.6	62.4	0.0	99	45
Memphis, Tenn.	27.2	41.2	51.6	60.6	68.0	77.1	79.0	80.0	73.8	67.6	51.6	48.4	60.5	−1.1	98	− 3
Miami, Fla.	66.5	64.4	69.2	72.2	76.2	81.2	83.4	82.8	80.0	76.0	72.9	73.1	74.8	+0.4	92	31
Mobile, Ala.	51.5	50.1	59.4	65.2	72.2	79.0	80.7	81.6	75.9	69.1	58.8	57.0	66.7	−0.6	96	14
New York, N.Y.	25.2	33.0	35.0	46.0	59.6	68.4	74.6	70.4	65.8	53.2	44.8	38.9	51.2	−1.1	99	9
Norfolk, Va.	31.0	42.4	46.8	55.2	66.4	77.0	78.6	76.8	70.4	59.8	52.8	48.4	58.8	−0.7	104	11
North Platte, Neb.	13.4	30.8	39.0	48.4	60.5	72.1	79.6	73.4	69.2	57.2	34.8	30.8	50.8	+2.5	109	−18
Oklahoma City, Okla.	24.9	40.5	52.2	59.8	69.0	75.6	80.4	79.3	73.6	68.0	45.6	43.0	59.3	−0.1	101	2
Portland, Me.	19.0	27.1	39.4	40.4	52.7	60.4	68.5	65.8	60.0	48.0	37.4	24.5	44.5	−1.0	95	−16
Portland, Ore.	39.4	42.1	46.9	51.8	56.9	62.4	66.7	66.7	61.7	54.2	46.8	41.2	53.1	0.0	99	27
San Francisco, Calif.	52.6	55.4	57.4	57.8	58.0	59.0	60.2	60.0	65.0	62.3	57.0	55.4	58.3	+2.2	84	38
Sault Ste. Marie, Mich.	13.4	18.6	20.8	36.7	49.0	56.2	65.8	64.9	57.8	45.4	30.6	23.6	40.2	+1.0	94	−20

Table II.—*Monthly and Annual Rainfall, in Inches, 1940, in Cities of the United States*

Cities	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	Annual Dept.
Albuquerque, N.M.	0.52	0.58	0.48	0.21	1.71	1.32	0.62	3.25	1.99	0.36	1.45	0.87	13.36	+ 5.29
Bismarck, N.D.	0.02	0.28	0.79	2.93	1.04	2.13	3.35	0.32	1.38	1.38	0.47	0.10	14.19	− 2.17
Buffalo, N.Y.	2.47	3.71	2.35	2.31	3.51	4.44	1.48	3.12	3.72	1.15	4.38	3.37	36.01	+ 0.01
Charleston, S.C.	3.31	3.73	2.62	1.77	2.01	2.07	7.15	16.71	2.16	0.06	1.54	2.36	45.49	+ 0.17
Chicago, Ill.	1.25	0.89	2.41	3.17	5.16	1.31	1.29	3.95	0.31	3.26	2.36	1.38	26.74	− 6.17
Del Rio, Tex.	0.33	1.30	2.21	1.98	3.77	5.13	0.08	5.62	0.18	0.79	0.52	0.38	22.29	+ 2.39
Helena, Mont.	0.55	0.66	0.65	1.14	1.37	1.46	1.79	T	2.00	0.42	0.36	0.04	10.44	− 3.22
Houston, Tex.	1.53	3.18	0.66	3.21	2.22	7.21	2.79	0.82	2.49	4.85	9.06	5.30	43.32	− 3.81
Knoxville, Tenn.	2.31	3.47	5.09	4.28	5.13	4.48	2.46	5.25	1.17	2.12	1.76	2.90	40.42	− 7.12
Los Angeles, Calif.	4.33	5.43	1.55	1.61	0.02	T	T	0.00	0.01	1.47	0.34	5.50	20.26	+ 5.03
Memphis, Tenn.	1.83	4.71	2.51	4.88	1.74	2.78	4.11	2.40	1.88	1.69	3.27	3.17	34.97	−12.75
Miami, Fla.	2.85	2.42	3.28	0.76	11.11	13.53	1.92	9.59	17.81	2.93	1.48	3.97	71.65	+15.99
Mobile, Ala.	2.65	5.56	4.19	4.78	4.37	12.49	9.82	2.24	4.86	0.57	3.00	7.74	62.27	+ 0.66
New York, N.Y.	1.96	3.33	4.49	5.41	6.84	3.11	2.50	5.06	3.22	2.67	3.91	2.53	45.03	+ 1.89
Norfolk, Va.	2.35	2.38	2.05	3.37	3.64	2.31	3.44	10.14	4.10	1.10	4.45	1.16	40.49	− 3.71
North Platte, Neb.	0.31	0.23	1.12	0.88	0.66	2.84	0.66	0.71	0.88	1.56	0.45	0.68	10.98	− 7.43
Oklahoma City, Okla.	0.70	3.35	0.02	4.46	3.89	3.05	5.21	3.14	2.71	1.72	4.66	1.89	34.80	+ 3.65
Portland, Me.	3.69	4.57	5.34	7.12	5.82	3.13	3.18	1.15	3.92	0.32	5.50	3.11	46.85	+ 4.91
Portland, Ore.	2.36	10.82	5.12	2.76	1.57	0.06	0.39	0.07	3.56	4.26	4.82	5.03	40.82	− 0.80
San Francisco, Calif.	9.98	7.81	5.32	0.94	0.63	0.01	T	T	0.59	1.05	2.22	6.25	34.80	+12.78
Sault Ste. Marie, Mich.	1.97	0.78	0.97	1.38	2.76	4.13	1.62	3.67	1.99	2.31	3.71	2.12	27.41	− 4.92

T=Trace: less than 1/100 of an inch.

Table III.—*Duration of Sunshine, in Hours, 1940, in the United States*

Cities	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	Annual Dept.
Albuquerque, N. M.	236	227	311	300	369	347	347	326	266	278	188	186	3381	−114
Bismarck, N.D.	155	90	147	152	278	322	351	359	313	196	112	110	2587	− 75
Buffalo, N.Y.	93	115	165	233	199	284	353	268	218	189	77	81	2275	− 67
Charleston, S.C.	180	183	224	289	347	267	281	218	243	276	195	155	2858	− 73
Chicago, Ill.	156	96	160	229	217	297	362	218	282	235	132	76	2460	−204
Del Rio, Tex.	202	198	242	247	279	260	333	306	311	224	141	144	2887	+181
Helena, Mont.	137	164	238	194	365	344	337	386	212	165	125	144	2811	+137
Houston, Tex.	166	132	172	159	238	242	221	242	284	225	128	118	2325	−416
Knoxville, Tenn.	160	132	212	238	320	337	267	276	317	268	139	135	2801	+185
Los Angeles, Calif.	145	211	245	289	311	284	356	340	330	305	262	197	3275	+ 63
Memphis, Tenn.	149	73	183	190	318	262	187	330	296	285	168	139	2580	−198
Miami, Fla.	243	251	266	310	306	255	257	220	145	222	179	180	2834	−150
Mobile, Ala.	187	113	201	186	332	204	216	288	289	297	149	117	2577	−190
New York, N.Y.	194	178	215	205	216	274	292	224	253	226	111	158	2546	−134
Norfolk, Va.	177	186	238	211	280	294	299	188	243	215	172	167	2670	− 42
North Platte, Neb.	189	149	199	240	381	366	328	280	216	279	193	155	2975	−118
Oklahoma City, Okla.	203	180	283	291	337	348	371	291	269	277	159	152	3161	+153
Portland, Me.	195	186	246	228	245	308	311	337	232	225	105	116	2734	+141
Portland, Ore.	91	66	155	167	316	363	290	345	158	98	77	86	2212	+ 65
San Francisco, Calif.	132	168	251	279	302	327	314	249	249	231	172	146	2818	−117
Sault Ste. Marie, Mich.	88	126	225	237	196	219	276	213	108	127	33	34	1881	−244

ing the estimated wheat
) to less than half of the
: harvest. Weather condi-
s also reduced the wheat
)s to far below the normal
many of the countries of
heastern Europe.

here was unusually heavy
fall in Zululand on May 4
5, 23·4 in. of rain falling in
ır. at Eshowe, the old capi-
of Zululand. This is proba-
a record for South Africa,
it caused great damage to
ls and railways, washing
y bridges and dams.

(D. Bru.)

Table IV.—*Monthly Rainfall in Inches for 1940, Outside the United States*

Cities	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
London	2.5	1.6	3.4	1.6	1.2	1.2	2.7	0.1	1.4	2.4	6 8	
Edinburgh	0.8	0.9	2.2	2.2	1.7	0.5	8.3	0.7	2.3	2.3	3.7	
Utrecht	1.1	1.3	3.7									
Lisbon												
Leningrad												
Moscow												
Calcutta	0.0	0.3	6.2	0.1	6.6	7.7						
Bombay	0.8	0.4	0.2	0.0	0.0	30.0						
Baghdad	2.0	1.3	0.7									
Rangoon												
Singapore	3.4	4.2	2.6	6.1	5.3		6.2	10.6	5.8			
Cape Town	0.2	1.7	1.1	3.8	3.5	4.9	2.7	1.1	2.0	1.6		
Johannesburg	2.1	2.7	4.0	1.2	1.3	0.0	1.7	0.0	4.9	1.0		
Salisbury (Rhodesia)	4.7	10.6	4.8	2.0		0.3	0.0					
Quebec	2.7		6.4	4.3								
Toronto	2.0	1.5	2.2	2.6	5.0	3.7	1.6	2.7	3.7			
Winnipeg	0.5	0.7	0.7	1.7	1.2	4.7	1.2	1.3	1.0			
Victoria, B.C.	2.1	3.1	3.0	1.4	1.3	0.1	0.9	0.4	2.7			
Sydney	0.6	0.8	0.6	6.2	5.9	1.6	4.7	2.5	3.2			
Melbourne	2.0	0.5	0.6	3.3	1.3	1.7	2.1	1.1	2.8			
Perth	0.7	0.1	0.1	1.0	2.1	4.5	3.5	2.2				
Wellington, N.Z.	5.3	3.3	1.4	5.6	6.0	2.0	2.5	3.4	4.1	4.2		

Table V.—*Monthly Mean Temperatures in °F for 1940, Outside the United States*

Cities	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
London	31.4	37.9	43.9	49.0	56.4	63.4	61.0	62.5	57.1	50.3	45.1	
Edinburgh	32.4	36.5	41.7	43.8	52.3	60.1	56.5	57.9	52.2	48.1	43.4	
Stockholm	19.6	13.5	23.2	37.0	52.0	60.8	64.9					
Utrecht	22.8	30.4	42.6									
Lisbon												
Leningrad												
Moscow												
Calcutta	66.6	72.6	78.7	87.3	87.1	86.4						
Bombay	76.3	77.1	77.9	81.9	86.1	83.9						
Baghdad	50.0	55.1	56.3									
Rangoon												
Singapore	80.1	80.4	82.2	82.1	82.1		82.5	80.8	80.9			
Cape Town	72.0	72.3	67.5	62.5	58.7	56.7	50.5	58.5	56.7	64.3		
Johannesburg	67.4	67.1	64.9	59.7	55.7	51.3	50.5	56.9	58.8	62.6		
Salisbury (Rhodesia)	69.0	68.1	68.7	65.7		57.7	55.7					
Quebec	9.8		23.6	36.2								
Toronto	18.5	24.5	26.3	41.4	54.1	63.3	70.7	68.9	61.3			
Winnipeg	2.3	9.3	17.1	36.2	52.3	59.1	68.4	67.5	61.9			
Victoria, B.C.	42.8	44.1	48.1	51.7	56.5	58.9	59.3	62.1	58.8			
Sydney	73.3	72.6	72.9	64.9	58.5	56.3	54.9	56.3	60.5			
Melbourne	66.8	64.9	69.8	58.1	52.6	50.4	51.1	50.9	55.3			
Perth	74.0	77.5	70.9	65.2	60.7	59.5	55.7	57.6				
Wellington, N.Z.	63.3	60.9	57.3	52.5	49.2	48.1	46.5	48.9	51.6	51.8		

thodist Church.

he Methodist Church, as
stituted by the plan of
n which was adopted by the
ing conference in 1939, de-
d most of the year to com-
ing the details of the new
nization and appointing its
ial personnel. The first gen-
conference, meeting in
ntic City, N.J., April 24–
7 4, 1940, fixed the head-
rters of the several Benev-
t boards as follows:
sions and church extension, New York, N.Y.; education, Nash-
, Tenn.; temperance, Washington, D.C.; lay activities,
cago, Ill.; pensions, Chicago, Ill.; hospitals and homes,
umbus, O.

uring the summer the six jurisdictional conferences into
ch the church in the United States is divided held their sev-
initial sessions. The western jurisdiction elected an additional
op to complete its quota, the Rev. Bruce R. Baxter; and the
ral jurisdiction (Negro) chose two bishops, the Rev. Lorenzo
King and the Rev. W. A. C. Hughes. Bishop Hughes died a
weeks later. In July the Administrative boards, elected by the
eral conference on nomination of the bishops, met in Chicago
organization. The executives were elected as follows:

oard of publication (formerly known as Book committee): chairman,
iam H. Swiggart, Jr.; vice-chairman, Troy W. Appleby.
oard of missions and church extension: president, Bishop Arthur J.
re; vice-presidents: Bishop F. J. McConnell, Bishop A. Frank Smith,
J. D. Bragg, John W. Hawley. Division of foreign missions: executive
tary, Ralph E. Diffendorfer; Division of home missions and church
nsion: executive secretaries: E. D. Kohlstedt, Thomas D. Ellis, Fred
Mueller. Woman's division of Christian service: executive secretaries,
ign department: Sallie Lou McKinnon, Elizabeth M. Lee, Mrs. Otis
re, Mrs. Velma H. Maynor. Home department: Muriel Day, Mary L.
well, Mrs. J. W. Downs, Grace G. Steiner. Social relations: Thelma
ens. Joint division of education and cultivation: Willard G. Cram.
oard of education: president, Bishop Adna Wright Leonard; executive
taries: Harry W. McPherson, W. A. Alexander (since deceased), John
chisler, N. F. Forsyth, Lucius H. Bugbee, C. A. Bowen.
oard of hospitals and homes: executive secretary, N. E. Davis.
oard of Pensions: Bishop J. Ralph McGee; executive secretaries:
mas A. Stafford, Charles W. Tadlock.
oard of temperance: president, Bishop H. Lester Smith; executive sec-
ry, Ernest H. Cherrington.
oard of lay activities: president, Edgar T. Welch; executive secretaries:
rge L. Morelock, E. Dow Bancroft.

n pursuance of general conference action establishing a single
ominational weekly called the *Christian Advocate,* the Board
Publication elected Rev. Roy L. Smith editor and fixed the
e of publication at Chicago. The *Epworth Herald* was discon-
ued, as were the several regional editions of the *Christian Advocate.* Nolan B. Harmon was chosen as book editor with John W. Langdale associate and editor of *Religion in Life.* Editors of Church school literature are Lucius H. Bugbee and C. A. Bowen. Robert N. Brooks is editor of the *Christian Advocate* for the central jurisdiction. Elmer T. Clark edits *World Outlook;* Grover C. Emmons the *Upper Room* and Bettie S. Brittingham the *Methodist Woman.*

The Discipline of 1940 distributes the Methodists of the United States among the six jurisdictions as follows: Northeastern jurisdiction, 1,627,682; southeastern jurisdiction, 2,040,677; central, 329,325; north central, 1,706,326; south central, 1,409,351; western, 374,898. The residences of the effective bishops were fixed by the jurisdictions as follows:

Northeastern: Boston, Mass., G. Bromley Oxnam; New York, N.Y., F. J. McConnell; Syracuse, N.Y., Charles W. Flint; Philadelphia, Pa., Ernest G. Richardson; Washington, D.C., Adna W. Leonard; Pittsburgh, Pa., James H. Straughn.

Southeastern: Richmond, Va., Wm. W. Peele; Charlotte, N.C., Clare Purcell; Columbia, S.C., William W. Watkins; Atlanta, Ga., Arthur J. Moore; Birmingham, Ala., J. Lloyd Decell; Jackson, Miss., Hoyt M. Dobbs; Louisville, Ky., U. V. W. Darlington; Nashville, Tenn., Paul B. Kern.

Central: Atlantic coast area, L. H. King; Columbus, O., Robert E. Jones; Baltimore, Md., Alexander P. Shaw.

North Central: Cincinnati, O., H. Lester Smith; Indianapolis, Ind., Titus Lowe; Detroit, Mich., Raymond J. Wade; Chicago, Ill., Ernest L. Waldorf; St. Paul, Minn., Ralph S. Cushman; Des Moines, Ia., J. Ralph Magee.

South Central: St. Louis, Mo., John C. Broomfield; Omaha, Neb., William C. Martin; Oklahoma City, Okla., Charles C. Selecman; Houston, Tex., A. Frank Smith; Dallas, Tex., Ivan Lee Holt.

Western: Portland, Ore., Bruce R. Baxter; Los Angeles, Calif., James C. Baker; Denver, Colo., W. E. Hammaker.

Retired bishops residing in the United States are:

W. N. Ainsworth, Macon, Ga.; William F. Anderson, Winter Park, Fla.; Edgar Blake, Coral Gables, Fla.; Hiram A. Boaz, Dallas, Tex.; Warren A. Candler, Atlanta, Ga.; James Cannon, Jr., Richmond, Va.; Matthew W. Clair, Covington, Ky.; Horace M. DuBose, Nashville, Tenn.; Sam R. Hay, Houston, Tex.; Edwin H. Hughes, Washington, D.C.; Frederick T. Keeney, Miami, Fla.; Frederick D. Leete, DeLand, Fla.; Charles L. Mead, Kansas City, Mo.; George A. Miller, San Jose, Calif.; Charles B. Mitchell, Pasadena, Calif.; John M. Moore, Dallas, Tex.; Thomas Nicholson, Mt. Vernon, Ia.; John L. Nuelsen, New York, N.Y.; Herbert Welch, New York, N.Y.

Bishop J. R. Chitambar of Jubbulpore, India, died Sept. 4, 1940.

Great Britain.—The annual conference session of the Methodist Church in Sheffield, July 16–20, 1940 was one of the shortest on record, owing to war conditions. Though 88 young men qualified for admission, none was accepted, because of government regulations regarding exemptions from military service. It was reported that 100 ministers were serving as chaplains with the forces. Because of the forced evacuation of Channel coast populations more than 50 churches in that region gave notice that they could not support a pastor this year. A War Emergency fund of £50,000 was authorized to care for refugees and preachers left without appointment. The presence of a pacifist group created some tension.

The year's statistics showed declines. Church membership was 787,835, a loss of 10,336; Sunday school enrolment was off 50,000, and Guild membership 60,000. Receipts for Home missions dropped £3,000 and for Foreign missions £13,000. The Oecumenical Methodist conference scheduled for Oxford in 1941 was indefinitely postponed. Two theological colleges were closed—Didsbury and Handsworth. The Publishing House had a deficit of £6,289, with sales down by £10,000. There was "a catastrophic shortage of paper." Conference officers for 1940 were: president, the Rev. Henry Bett; vice-president, William E. Clegg; for 1941: president, the Rev. William H. Armstrong, vice-president, Lord Rochester. The Rev. Edwin French continued as secretary. Even in the face of the ruthless bombings of the metropolis, the conference voted to meet in London in 1941. Chapel debts in the aggregate of £103,762 were paid in 1939, leaving £1,400,777 unpaid. Thirty-six new chapels were completed at a cost of £173,993. Debt-free chapel properties numbered 11,439.

(J. R. J.)

Metropolitan Museum of Art: *see* Art Exhibitions; Art Galleries and Art Museums.

Mexico, a federal republic, between the United States and Central America and bordering the Pacific and Atlantic (Gulf of Mexico); language, Spanish; capital, Mexico City; president, Manuel Ávila Camacho; area, 767,168 sq.mi. Population, 1940 census (provisional report): 19,446,065. The main cities are: Mexico City, 1,451,616; Guadalajara, 220,049; Monterrey, 180,942; Puebla, 137,324; Mérida, 98,334; León, 86,089; Tampico, 81,334; Aguascalientes, 81,124; San Luis Potosí, 78,042; Torreón, 76,613; Veracruz, 74,541; Chihuahua, 57,456; Pachuca, 52,387. In 1930 about 55% of the population was mixed, 29% Indian, 15% white. Foreigners constituted less than 1%. Around 14% spoke only Indian tongues.

History.—Mexico includes 28 states, each with its own governor and legislature and a limited autonomy, and three territories and a federal district, with governors appointed by the president. The national government is administered by a president elected for six years, and a bicameral congress. The 170 members of the chamber of deputies are elected for three years and the 58 of the senate for six years, by universal suffrage.

In 1940 Mexico was dominated by the hotly contested presidential election, which threatened for a time to provoke a large-scale revolt. Economic stringency and business stagnation attended the political uncertainty, which also slowed up the government's drastic social reforms. Vigorous activity in connection with national defence was unhampered, however, and war conditions in Europe forged stronger economic and diplomatic bonds between Mexico and the other American republics. The year ended with the new administration firmly entrenched and the nation optimistic.

The election of the republic's new president, General Man Ávila Camacho (*q.v.*), retired minister of national defence candidate of the official Mexican Revolutionary party, fraught with violence and unrest. Reassured by incumbent Pr dent Lázaro Cárdenas that the election would be a free express of public opinion, the leading opposition candidate, General J Andreu Almazán, conducted a vigorous campaign, and the stor balloting on July 7 ended with both parties claiming victory a huge margin. Distrustful of the administration, Almaz party made a separate tabulation of votes, asserted it had the presidency and a majority in congress, and prepared to t office. Almazán himself retired to the United States while s radic demonstrations and uprisings by his followers in Mex made it appear that the election would be disputed by arm force. When two rival congresses met in September, some thou was given to prolonging President Cárdenas's term or select of a compromise chief executive to avert revolution, but the te situation gradually subsided as a series of events discouraged opposition party. On Sept. 1 Cárdenas recognized the offi party's congress, which then declared Ávila Camacho preside elect by virtue of 2,476,641 votes to 151,101 for Almazán a 9,840 for Rafael Sánchez Tapia, former minister of natio economy. (The opposition claimed 2,265,199 of the total vo for Almazán.) A week later Avila Camacho won over to his s a large number of Almazán's followers by endorsing much of th program. Meanwhile, government troops gradually localized a quelled small armed rebellions in the north and riots in the f eral district, where Almazán's staunchest support lay. After o cial recognition was accorded Ávila Camacho by the Uni States, Almazán renounced all claims to the presidency Nov. Ávila Camacho was inaugurated on Dec. 1.

As 48 were killed and about 400 injured in election day ric neutral observers agreed that violence and fraud at the p marred the voting and possibly even determined its resu Significant, however, was the fact that approximately 2,500,c voted, more than twice the number in the 1934 presidential el tion. This did not include the female vote, which was exclu because the constitutional amendment permitting it lacked t necessary approval of two-thirds of the states. Both before a after the election, the press took full advantage of its freedo and the resultant expression of public opinion, divided as it w apparently tempered the policies of the victorious official par Heretofore relentless in pursuing its revolutionary program, t administration party, and especially the new president, espou doctrines as much in keeping with the opposition's moderate p gram as with its own socialistic six-year plan.

Without disinheriting the revolutionary program, Pres. Áv Camacho announced at his inauguration a new epoch of mater as well as spiritual consolidation of the social achievemen Mexico, he said, must now develop her natural resources by e tending credit and protecting capital, but without sacrificing bour and agrarian gains. The protection of small landholde another oppositionist plank, was also announced. The new ca net, apparently a stop-gap ministry, included both moderates a liberals. Ávila Camacho's first official act was the signing of amnesty decree for all who had committed political crimes duri the campaign. A Roman Catholic, the new president was endors by Archbishop Martínez. Ávila Camacho asserted that comm nists (sometimes associated with the Cárdenas regime) wou have no place in his government. Like almost all Mexican pre dents, Ávila Camacho is essentially a military man, but he noted more for winning victory by conciliation than by batt

Reacting to European war developments, Mexico hast launched a program of national defence. In the summer, immig tion, aliens within the country and unlicensed radio stations w

ely scrutinized. A virtual ban on nazi propaganda in the xican press was issued by the minister of interior, and Arthur trich, press attaché of the German legation, was expelled on rges of propaganda activities. In June the reaction was high- ted by the change of front by Vicente Lombardo Toledano, ler of the powerful Confederation of Mexican Workers, who nly denounced German aggression. On Aug. 20 the assassina- n of Lev Trotsky, famed Russian revolutionary, in Mexico City an alleged soviet agent brought the Communist party under rp criticism from President Cárdenas. In August congress en- ed a compulsory military training law for men between the ages 18 and 45, effective Jan. 1, 1941. Tentative plans were formed November for a $600,000,000 expenditure on naval bases and tifications and the purchase of seaplanes, torpedo boats, and marines. (*See* HISPANIC AMERICA AND THE EUROPEAN WAR.)

Economically, Mexico passed through another critical year. siness was retarded because of political uncertainty. High es, credit restrictions, labour strikes and limited markets l raw material sources, due to war conditions abroad, inten- ed the depression. Some new capital entered the country, much of this and most of the domestic funds were invested real estate and homes instead of in commercial enterprises. e peso rose in value from a low of 17.35 cents U.S. to 20.75 ts, but the domestic economy was relatively unaffected.

Mexico's vital oil industry, nationalized in 1938 and operated the petroleum workers' union, experienced another hectic year. duction was up about 1%, but exports fell from 19,220,000 . in 1939 to about 14,000,000 bbl. in 1940. Elimination of mar- s in Italy when that country entered the European war in June s partly offset by important sales to Japan and several United tes firms in May, including a complete settlement with Sinclair Co. for properties expropriated in 1938. In August two ex- ts appointed by the Mexican courts evaluated the other expro- ated foreign properties and submitted the figures of 172,727,000 os ($34,546,000) and 181,292,000 pesos ($36,258,000) as a is for compensation. The companies themselves, however, re- ed to countenance either sum, and further settlement was left the new administration of Mexico. Meanwhile, with a 68,000,- -peso deficit accumulated during two years of government nership, the Mexican oil industry faced demands by President rdenas for drastic economies. The petroleum workers fought reorganization plan until Dec. 11, when it was agreed that a nt commission of labour and management would effect such asures as the dismissal of all employees hired since the date of propriation and certain reductions in salaries and staff personnel. Similarly, the union-operated railways of Mexico, also national- d in 1938, came under sharp criticism. In a memorandum arging lack of discipline, excessive emoluments, deficient re- irs, and lack of replacements, the minister of communications quested the new president to remove the industry from the man- ement of labour and place it under government control. Pres. ila Camacho drafted a bill, proposing that the railroads be ad- nistered by a committee of four representatives of the govern- nt and three of the union, and be run by a general manager pointed by the chief executive. Immediately the railroad labour ion appealed to its 36 units to fight the bill, but it passed ngress on Dec. 27.

The mining industry, backbone of the republic's economy, con- ued to suffer from the European war, which, instead of lifting rkets and prices, actually lowered them. Internal difficulties ch as strikes and high freight rates further hampered the in- stry. Silver, most important mineral, continued to be quoted 35 cents on the New York market, and practically all the ex- rts went to the United States, but much was merely held there r future sales.

MASS MEETING of the followers of Gen. Manuel Ávila Camacho in Sonora shortly before his election to the presidency of Mexico July 7, 1940

Approximately 100,000 tons of lead and 50,000 tons of unsold zinc had accumulated within the country as a result of war conditions.

Mexico's social revolution slackened somewhat in the face of political unrest and economic stringency, but certain reforms continued unabated. Government-supported agrarian and labour movements were less in evidence than during the preceding year. In September, President Cárdenas announced that, during the six years of his administration, the government had redistributed a total of 45,349,000 acres of land to more than 1,020,594 peasants on 10,651 new communal farms. This, along with previous land division, had practically transformed Mexico's agrarian system from large feudal holdings with peon labour to co-operative community farms (*ejidos*) and small privately owned lands. A new policy was adopted on Dec. 11, when Pres. Ávila Camacho decreed that individual land titles would be given as soon as possible to the 1,500,000 peasants living on the nation's 15,000 communal farms. Under the decree the 65,000,000 acres were to be parcelled among the peasants, but communal operation, if not communal ownership, was to continue. Owners of small properties were secured in their possessions by a presidential measure of Dec. 21.

During the Cárdenas administration 57 irrigation projects were undertaken to reclaim extensive arid lands, including the three great dams of Río Yaqui-Angostura in Sonora, in 1940 practically complete, the Palmito in Durango, and Río San Juan-El Azúcar in Tamaulipas, both more than half finished. In the summer Mexico

City's prolonged water shortage was relieved by the installation of a pumping station providing over 100,000,000 quarts of water daily.

Education in the last 12 months of the six-year plan ended with some notable results. The rapid extension of rural education into the remote Indian villages had resulted in an increase by 400,000 in the enrolment of primary schools and a reduction in illiteracy from 50% to 45%. An experiment to teach adult Indians to read and write their own languages by reducing them to simple alphabets for instruction was expected to affect the 3,000,000 Indians who speak their native tongues in preference to Spanish.

A haven for European refugees, Mexico threw open her doors to the 80,000 to 200,000 Spanish republicans in France, but, as transportation facilities were lacking, relatively few arrived. Several hundred already in the country were granted naturalization papers, and 500 newly arrived were distributed in the rural areas in July. Persecuted intellectuals from all over Europe petitioned for passports, but in August Mexico moved to bar all but Spaniards. In September 100 Jewish refugees from Germany and other parts were denied admission, but in the following month passports were granted to 40 anti-fascist Italian intellectuals.

The Roman Catholic church continued to operate in Mexico with full religious freedom. Officially, the number of priests was limited to 350, about one for each 45,000 inhabitants, and the church is prohibited from holding real estate, but the enforcement of other anti-church measures was relaxed.

Foreign Relations.—Maintaining neutrality in the European war and membership in the League of Nations, Mexico nevertheless announced a pro-Ally government policy in June. Relations with Great Britain, broken off in 1938 during the oil expropriation controversy, remained severed, but unofficial negotiations for their resumption were carried out during 1940. Agreement was reached early in the year between Mexico and the governments of France, Germany and Italy for the free passage of several thousand Spanish civil war refugees in France who desired to emigrate to Mexico.

The first Inter-American Indian congress was held at Pátzcuaro, Mexico, in April, establishing a permanent Institute of Indian Affairs with its seat in Mexico. Information was exchanged resulting in a concrete program for the betterment of the 30,000,000 Indians in the Americas. In July at the Pan-American conference at Havana, Mexico became a signatory party to a pact which provided for the setting up of machinery to seize and administer jointly any European possessions in the western hemisphere which are threatened with transfer of sovereignty. During the summer, Major Antonio Cárdenas, ace Mexican flier, made a 14,000-mi. good-will flight to the United States and around Latin America.

Relations with the United States were strained early in the year. In January President Cárdenas denounced the Monroe Doctrine as a unilateral policy, but endorsed the several inter-American agreements to settle disputes and resist invasion collectively. In May the United States note demanding immediate reparations for or submission to arbitration of the oil expropriations was dismissed by Mexico with a reiteration of her stand that the controversy was purely a Mexican problem and therefore outside the realm of international relations. No further representations on the issue were made during the year. On Nov. 12, however, when the United States formally recognized Gen. Ávila Camacho as president-elect of Mexico and sent its own vice-president-elect, Henry A. Wallace, to the inauguration as official representative, relations between the two countries improved. Closer co-operation between the two in national defence programs was foreseen. In December provision was made for the use of Mexican airports for stop-overs by United States army planes flying to and from the Canal Zone.

During the last two months of the year negotiations for the leasing by the United States of Mexican naval bases and the construction of new ones with United States funds were rumoured, but such plans were repeatedly denied in responsible quarters of both governments.

Education.—Public instruction is free and compulsory. Urban schools are supported largely by the states; rural schools by the government. There are over 20,000 schools of all kinds in the country. Illiteracy (50% in 1930) was reduced to 45% in 1940 as a result of promoting rural education, especially among the Indian population.

In 1940 there were 12,974 rural schools supported by the government, 2,406 by the states, and 1,189 by private organizations. There were 10 institutions of university rank, including the National Autonomous university and National Labor university, both at Mexico City. Public education accounted for the second largest national expense. The 1941 budget called for 77,000,000 pesos for that purpose (73,800,000 pesos in 1940).

Banking and Finance.—The monetary unit is the peso (value 20.75 cents U.S. on Dec. 31, 1940, with parity not determined 17.35 cents in 1939). The national gold reserve in 1940 amounted to $31,000,000 U.S. ($21,400,000 in 1938). The national budget in 1941, largest in Mexican history, called for approximately 492,000,000 pesos (448,769,000 in 1940). Mexico in 1940 did not share in the loans made to Hispanic American countries by the United States Export and Import bank.

Trade and Communications.—Foreign trade in 1939 totalled 1,544,098,107 pesos, a 15·9% increase over 1938. Germany succeeded Great Britain as second to the United States in Mexican commerce. In 1940, however, Germany practically dropped from the trading.

Exports in 1939 totalled 914,389,882 pesos (9·1% more than in 1938) with mineral products, chiefly silver, gold, lead, copper and petroleum constituting 69·9%. In the first half of 1940 exports rose in value to 520,100,000 pesos (490,300,000 pesos in the same part of 1939). The United States took 72·4% in 1939, Germany 7·1%.

Imports in 1939 came to 629,700,000 pesos (27·4% over 1938) with automobiles, rayon yarn, machinery and other manufactures the main commodities. In the first six months of 1940 imports rose to 353,100,000 pesos (306,100,000 pesos in the first half of 1939). The United States supplied 61·8% of the 1939 imports, Germany 16·3%.

Mexico's external communications are by steamship service, especially through Veracruz, by three main railways to the United States, and one to Guatemala; by increasingly important air service north and south and to the West Indies; and by highway, notably through Nuevo Laredo to the north.

Other highways are mainly from Mexico City west to Guadalajara, southwest to Acapulco, east to Veracruz, and southwest toward Oaxaca. There were 24,363 km. of railway in 1939, over 50% of which was government owned. Mexican air service carried 85,481 passengers, 3,852 tons of freight, and 269,690 kg. of mail in 1939. There were 138,081 telephones with a linage of 63,407 km. in 1938 and 41,169 km. of telegraph lines. Licensed radio stations number 103.

Agriculture and Mining.—Mexico's chief resource is mining. There are some 31,000 mining properties, about 97% of which are owned by foreigners, and almost all of which yield silver. For four centuries Mexico has produced 40% or more of the world's silver (2,359,826 kg. in 1939). In the first eight months of 1940 production was up 17·1%. Other important minerals include

ld (26,178 kg. in 1939), copper (44,300 metric tons), lead 19,500 metric tons) and zinc (134,100 metric tons), and such ategically important minerals as antimony, mercury, arsenic, norphous graphite and molybdenum. Coal is produced in Co-uila state (1,000,000 tons annually), and opals are found in the te of Querétaro. Holding sixth place in world petroleum pro-ction, Mexico's 1940 production was estimated at 43,470,000 l. (42,897,500 bbl. in 1939).

The extent of agricultural land in Mexico is estimated at 275,-0,000 ac., much of which was in 1940 inadequately developed. ading crops with their 1938 production (in metric tons) were: ize (1,692,660), cotton (66,335), wheat (324,927), sugar cane ,132,260), bananas (546,936), henequen (sisal-hemp) (133,-7), coffee (41,331) and beans (105,499). Rice, barley, chick-as and various fruits are also grown.

There were more than 30,000,000 head of livestock in Mexico luding cattle, horses, mules, donkeys, sheep, goats and pigs. anufactures include sugar and oil refining, textiles, tobacco oducts, iron and steel, rubber, leather, glass, flour and meat cking. Fishing is important on the west coast. An important ource was the tourist trade, mostly from the United States. sitors from that country in 1939 spent $53,000,000 in Mexico, out $1,000,000 more than in 1938. In the first nine months 1940, 48,854 tourists entered Mexico (46,634 in the same riod of 1939).

Army and Navy.—Mexico's largest appropriations were for ional defence (110,000,000 pesos in 1941; 94,025,000 pesos in 40). The standing army was unofficially estimated at 56,000, h 150,000 in reserve. Compulsory military training for men m 18 to 45 years of age, effective Jan. 1, 1941 expected to draft 000 annually until a reserve of 200,000 is reached. The air-ce had 90 planes and 700 men and was being steadily increased. e navy had no battleships, cruisers, destroyers, or submarines, t had six escort vessels, ten coast guard boats and three patrol sels. (*See* also INTERNATIONAL LAW; PETROLEUM; UNITED ATES.)

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(L. W. BE.; M. L. M.)

ica. In the discussion of mica one is mainly concerned with sheet mica; although there are many commercial uses for ap mica, this is a low grade material that falls into a different egory from that of sheet mica. Sheet mica is classified ac-ding to the standard size of sheet that can be trimmed to pe, and that below the smallest size, but still too large for ap, goes to splittings, for the production of built-up mica pes, using a plastic binder. The growing demand for built-up ca has made splittings a feature of the market, with a consump-n in the United States about double that of sheet mica.

The normal world total output of about 50,000 metric tons, of ich 10,000–12,000 tons is sheet, and the remainder scrap, de-ned rather sharply in 1938 in practically all countries. The tput of British India stands foremost, with mainly sheet and ittings, but in recent years considerable amounts of scrap ve apparently been included, so that the data available have le meaning. Other British empire producers include Canada, odesia, South Africa, Tanganyika and Australia, but none of se is of any great commercial importance except Canada, and re output has declined heavily in the past decade.

The United States output of 470 short tons of sheet in 1938 clined to 407 tons in 1939 but scrap rose from 20,300 tons in 1938 to 24,700 tons in 1939. Imports dropped by about half in 1938, to 4,530 tons of scrap and ground mica, 175 tons of sheet and 890 tons of splittings, but increased slightly in 1939 and 1940.

Heretofore mica has lacked any satisfactory substitute for its most important uses, but the discovery of an artificial film made from bentonite gives promise of serving for many of the ordinary electrical uses of mica, but due to a high power factor it had not been developed to a point where it could be used in high grade condensers. (G. A. RO.)

Michael, King of Rumania: *see* MIHAI (MICHAEL).

Michelin, Edouard (1859–1940), French manufacturer. He established with his brother, André, the Michelin Tire company, which was the first to use pneumatic tires on motor vehicles. They started with the manufacture of bicycle tires but with the perfection of the motor car they made tires for the new vehicle and long held a leading place in the business, with factories in the United States as well as in France. He died at his home in Orcines, France, Aug. 25.

Michigan, one of the north central group of states, was the 26th state to become a member of the United States. It is popularly known as the "Wolverine state"; area, 97,940 sq.mi.; population (U.S. census, 1940) 5,256,106; (estimate Jan. 1, 1941) 5,285,000. Capital, Lansing, 78,753. Larger cities were Detroit, 1,623,452; Grand Rapids, 164,292; Flint, 151,-543; Saginaw, 82,794. Of the state's population, 3,-454,867 were urban, or 65·7%. According to the U.S. census, 1930, whites comprised 96·03% of the population, Negroes 3·97%; of the whites, 81·93% were native born, 18·07% foreign born. According to the 1940 registration, there were 290,-730 aliens in Michigan, or 6·1% of the total in the continental United States. About 350,000 of Michigan's population lived in the upper peninsula which comprises approximately one-fourth of the state's land area and possesses nearly one-half of the state's 1,624-mi. shore line (longest fresh-water shore line of any state in the union).

MURRAY D. VAN WAGONER, a Democrat, was elected governor of Michigan Nov. 5, 1940

Although the rate of increase in population, 8·5%, was the lowest in the state's history, it nevertheless exceeded the 7·2% of increase of the country as a whole. Michigan was one of eight states which, on the basis of existing apportionment laws, would be entitled to additional representation in the United States house of representatives—the only northern state lying east of the Rocky mountains to make such a gain. The state's population increase was greater on the rural than on the urban side. Detroit, which in the first three decades of the century experienced population increases of 97%, 113% and 58%, respectively, grew only 3·5% between 1930 and 1940. Territorially, according to official figures, Michigan in 1940 expanded by nearly 70%, accordingly jumping from 22nd to 8th place among the states. This seemingly astounding feat was explained by the fact that the U.S. bureau of the census, thanks largely to the persistent efforts of former

Governor (1911–12) Chase S. Osborn, decided, in listing the area of the state, to include the 39,960 sq.mi. of Great Lakes' water surface lying within her borders.

History.—There was no session of the legislature in 1940. Politics, however, were lively throughout the year. In March the department of corrections removed Marvin L. Coon, Democrat, warden of Marquette prison, and appointed Simon R. Anderson, Republican, to succeed him. Upon the death of Judge William W. Potter, of the state supreme court, in July, Governor Dickinson appointed Emerson Richard Boyles, legal adviser to the governor, to fill the vacancy until Jan. 1. Following a long quarrel between the Crippled Children's commission and the governor, Hugh E. Vande-Walker, chairman of the commission, resigned in October after 14 years of service on the commission, submitting a 12-page letter of protest against the governor's policy. Governor Dickinson in July announced the creation of a Michigan National Defence council of 20 members with former Governor (1931–32) Wilber M. Brucker made state defence administrator.

In the September primary, 81-year-old Governor Dickinson, seeking return to the governorship, received a substantial plurality of votes in his race with seven other Republicans, though he failed to obtain a majority of the votes cast. On the Democratic side, Murray D. Van Wagoner, who had served as state highway commissioner since 1933, received the nomination. On the eve of the Republican state convention, late in September, nominee Dickinson made a spectacular move when he broke with Frank D. McKay, who had been chairman of the Michigan delegation at the Republican national convention and who was commonly regarded as one of the party "bosses." In the state convention's nominations, Dickinson was clearly dominant.

In the November election, Wendell L. Willkie, Republican nominee for the presidency received 1,039,917 votes and Roosevelt, Democratic nominee, 1,032,991 votes. Van Wagoner defeated Dickinson by 131,291 votes, marking the fifth instance in as many successive biennial elections where the governorship passed from one major party to the other. Other choices were: for lieutenant governor, Frank Murphy, Democrat; for secretary of state, Harry Kelly, Republican (re-elected); for attorney general, Herbert J. Rushton, Republican, defeating former incumbent (1937–38) Raymond W. Starr, Democrat, by a margin of 3,469 votes; for state treasurer, Theodore I. Fry, Democrat, regaining an office formerly held (1933–39), by the correspondingly narrow margin of 4,817; for auditor general, Vernon J. Brown, Republican (re-elected). In a nominally non-partisan race for supreme court justice, Emerson R. Boyles, Republican Governor Dickinson's appointee of a few months before, easily defeated Philip Elliott, endorsed by the Democratic convention. United States Senator Arthur H. Vandenberg, Republican, was re-elected. A lively demand for recounts of the votes for the offices of attorney general and state treasurer was intensified by the claim that in the city of Jackson voting machines had operated in such a way as to make it difficult to vote a straight Democratic ticket. However, no recounts were held. The election returned strong Republican majorities in both houses of the state legislature. Four referenda met varying fates in the election. A proposed constitutional amendment to liberalize the existing 15 mill limitation on assessments for school purposes failed of adoption by 240,000 votes; a civil service amendment providing for the inauguration of a broad merit system was adopted, 766,764 to 709,894; a proposal to subject to broader taxation Detroit motor bus service operating outside of the city limits failed by a margin of nearly 300,000 votes; a proposal for strict regulation of dental advertising won by a lead of over 200,000.

The post-election period was one of significant developments. Declaring that he hoped the appointment would lead to friend litigation which would clarify Michigan's laws of succession the executive office, Governor Dickinson on Nov. 19 appoint Mrs. Matilda R. Wilson of Detroit as lieutenant governor. At torney General Thomas Read, however, promptly asserted th the appointment was a nullity and that he would not recognize when the end of the year arrived the test case anticipated by Di inson had not materialized. On the eve of inauguration it becam known that Governor Dickinson was submitting to the incomi Republican senate a list of 58 appointments to office. Despi statements that the names were submitted "for information onl and were merely to confirm interim appointments, Governor-el Van Wagoner took this eleventh hour move sufficiently seriou to see that his hastily prepared rival list reached the senate the same time as Dickinson's list. As the session of the legis lature got under way, the Van Wagoner list appeared to favoured for confirmation.

Education.—Vocational guidance and problems of rural educa tion received special attention from the state department of pu lic instruction, under the superintendency of Eugene B. Ellio State financial aid to the extent of $41,000,000 was granted t public schools by the legislature. October enrolment figu recorded 59,907 students in public and non-public colleges a universities in the state; enrolment for the summer session w 17,524.

Charities and Correction.—Considerable skepticism had be expressed concerning the wisdom of county "home rule" admin tration of relief when the system was inaugurated in Dec. 19 However, the first biennial report of the Social Welfare comm sion was optimistic, though the commission did strongly reco mend a study of the desirability of establishing a uniform orga zation of county boards of social welfare. Total sales of pris industries amounted to $1,255,709. As of Sept. 30, 1940 of 7,6 prisoners 883 were serving life terms (Michigan does not ha capital punishment), 6,954 were American born, 3,274 Michig born.

Banking.—Frederick B. Elliott, Jr., state banking comm sioner, announced at the close of the year that examination ports reflected that the state's 349 banks, 11 trust companies a seven industrial banks were in the best condition they had been since several years prior to the bank holiday of 1933. Authoriz disbursements of dividends to banks placed in liquidati amounted to $6,274,200 in 1940.

Agriculture, Manufactures, Mineral Production.—Autho ties estimated a slight decline in the value of Michigan cro from $139,077,000 in 1939 to $138,737,000 in 1940. Michig continued its leadership among the states in the federal progra of the elimination of Bang's disease in cattle. About $1,000,0 worth of trees in the state forests and about the same amount the federal-owned forests in the state were blown down in a sev windstorm on Nov. 11.

Preliminary reports indicated a rapid increase in the prod tion of automobiles. At the close of the year, strikes were i pending in several industries. The year witnessed a $16,000,0 road-building program carried through, with 257 mi. built w the aid of federal funds. Congress passed a measure authoriz the construction of a bridge across the Straits of Mackinac.

Permits for oil and natural gas exploration totalled 1,113 1940. More than 35,000,000 bbl. of oil and nearly 20,000,000,0 cu.ft. of gas were produced.

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(L. G. V. V.)

chigan, University of. On April 3, 1940, the new building of the W. K. Kellogg ndation Institute of Graduate and Postgraduate Dentistry at University of Michigan was dedicated. It is believed to be finest and most adequately equipped institution of its kind he world. Postgraduate instruction for practitioners is given courses requiring from one to three days a week throughout semester, or in two-weeks' intensive courses; graduate inction, leading to advanced degrees, is under the supervision of graduate school.

he new residences for men and women students, constructed 938–39, and the "Michigan House plan," for their adminision, had their first year of actual operation in 1939–40, with ouraging results.

new student health service was opened in the spring of 1940, preparations were made for the construction of a building in roit, the gift of the Horace H. Rackham and Mary A. Rack- fund, in which the university's extension work in that city be conducted. On the academic side, the introduction of a ree program leading to honours in liberal arts was a notable nt of the year.

course in aviation under the auspices of the Civil Aeronautics nority was given during the year, and arrangements were made the institution of a Naval R.O.T.C. in the fall of 1940. The versity and its several faculties, in consultation with governtal authorities, also made preliminary plans to be of service arious ways in the national emergency. (A. G. R.)

lget Auto Racing: *see* AUTOMOBILE RACING.

lway Islands, a group of two small islands and several sand islets in lat. 28° 13′ N. and long. ° 23′ W., 1,149 miles N.W. of Honolulu, belonging to the ted States of America. The larger is Sand island; about 850 maximum height above sea level, 43 feet. The other is East- island; about 328 ac. and very low.

he islands are enclosed in a circular reef about five miles in neter, about four-fifths of which is above water. There are native inhabitants.

he group was discovered in 1859, by Captain Brooks, bark mbier," who took possession in the name of the United States. tain Reynolds, U.S.S. "Lackawanna," took possession formally Aug. 28, 1867.

y executive order, dated Jan. 20, 1903, the islands were placed er the control and jurisdiction of the U.S. navy department. d island is the site of a commercial cable station. The navy artment has licensed Pan American airways to establish facili- for use in connection with its transpacific commercial airline. he 76th congress authorized the navy department to conct a seaplane base at Midway and appropriated approximately 00,000 for the purpose. The work, involving dredging for a ing basin for tenders and oil tankers, ramps, barracks and inistration buildings and public works to accommodate perently one squadron of patrol planes and 300 men, was in gress (Jan. 1941). (L. S. F.)

ai (Michael) (1921–), king of Rumania after the forced abdication of his father, Carol II .) in 1940, was born at Sinaia on Oct. 25. He first became in 1927 under a regency when his grandfather, King Ferdid, died. Carol, the heir apparent, had renounced the right of cession because of his affection for Magda Lupescu; in 1930 he nted this decision, however, and returned to Bucharest to be wned. Mihai again became king Sept. 6, 1940 when Premier Antonescu persuaded his father to vacate the throne after a disastrous summer in which Rumania had lost most of the territory ceded to her after the World War of 1914–18. Princess Helen, his mother and Carol's divorced wife, returned to Bucharest and even the Iron Guard joined in public prayers for success of the young king's reign. The first weeks of his reign were anything but auspicious. November brought an earthquake, a series of mass executions by the Iron Guard and the threat of civil war, not to mention the possibility of further territorial demands on the country by her neighbours.

Milch, Erhard (1892–), German soldier and chief of the *luftwaffe* under Goering. Born at Wilhelmshaven on March 30, he studied at Danzig Technical high school and Koenigsberg university. During the World War of 1914–18 he became an army pilot and was advanced to flight general. After the war he became a commercial pilot. He had long been a friend of Goering, and when the nazis came into power in 1933 Milch was made secretary of state in the air ministry. In this capacity he founded the Air Sport league and the Hitler Flying Youth. In 1935 he began the task of building Germany's embryonic air force into a veritable armada of fighting planes. Putting his faith in mass output, Milch confined production to only a few standardized models and was thus able to procure thousands of planes in less than five years. Promoted to colonel general in 1938, he was created field marshal by Adolf Hitler on July 19, 1940. He is also chairman of the Deutsche Lufthansa, Germany's national airline.

Military and Naval Forces: *see* ARMIES OF THE WORLD; AIR FORCES; NAVIES OF THE WORLD.

Milk. The 1940 milk flow reached new high levels in the United States under the stimulus of increased industrial activity and consumer buying power and owing to the greatly enlarged demand for evaporated, condensed and dried milk for export to Europe, particularly to the United Kingdom. While the European war greatly curtailed exports of most American agricultural products, processed milk apparently is one agricultural product that is proof against wartime disruption. Its production and export in the U.S. expanded greatly during the World War of 1914–18, as it did during the European conflict beginning in 1939. U.S. exports of evaporated milk in 1940 were the largest in 19 years, and

A "MILK REBELLION" in Pittsburgh in April 1940 followed enactment of a Pennsylvania law that all families on relief should purchase one pint of milk daily for each child under 16. Housewives protested by returning half-filled bottles to the county relief office

for the first ten months in 1940 were 108,279,340 lb. compared to 23,006,000 lb. in the same months in 1939. U.S. exports of condensed milk the first nine months of 1940 were 14,357,592 lb. compared with 1,638,533 lb. in the corresponding months in 1939. Exports of dry milk the first ten months of 1940 were 9,892,324 lb. compared with 7,239,699 lb. in the like period of 1939. Production of evaporated milk in the ten-month period was 2,191,326,000 lb. in 1940 and 1,907,148,000 lb. in 1939; condensed milk, 51,078,000 lb. in 1940 and 31,613,000 lb. in 1939. Stocks of evaporated milk in the U.S. Nov. 1, 1940, were 358,294,000 lb., the largest on record for that date and 40,511,000 lb. over the five-year (1934–38) average. Stocks of condensed milk Nov. 1, 1940 were 9,115,000 lb. compared with 6,312,000 lb. a year earlier. Stocks of dried milk Nov. 1, 1940: dried whole milk 5,357,024 lb. compared with 3,952,443 lb. in 1939; dried skim milk 40,693,522 lb. in 1940 and 8,388,280 lb. in 1939; dried buttermilk 6,878,454 lb. in 1940 and 1,188,740 lb. in 1939.

There was no marked change in consumption of fluid milk and cream in the U.S. in 1940, although slight increases were reported in a number of cities where improved retail methods, such as quantity distribution in two-quart and gallon containers and every-other-day deliveries, effected small price concessions. Fifty per cent of the retail price of milk is represented by handling charges after the milk leaves the producer. Paper milk containers were put in use in New York, Chicago and other cities in 1940. but there was a dispute between glass bottle and paper bottle manufacturers as to whether paper containers were cheaper than glass. Since 1930 increased consumption of fluid milk and cream has merely kept pace with the increase in population, but in that time milk used in manufactured dairy products has increased 16%, from 44,100,000,000 lb. in 1930 to 51,200,000,000 lb. in 1939. Exact figures are not available, but milk used in manufactured dairy products in 1940 exceeded the previous high, 51,400,000,000 lb. in 1938, owing to record production of butter, cheese and canned and dried milk. (*See* also BUTTER; CHEESE; DAIRYING.) (S. O. R.)

Millis, Harry Alvin

(1873–), U.S. economist and labour arbitrator, was born at Paoli, Ind. May 14. After receiving his bachelor's and master's degrees at Indiana university and his doctorate at the University of Chicago, he was appointed professor of economics and sociology at the University of Arkansas in 1902. The next year he joined the faculty of Stanford university, and from 1912 to 1916 he was chairman of the department of economics at the University of Kansas. In 1916 he went to the University of Chicago as professor of economics. Here, in 1919, he first became associated with the problems of labour disputes, as chairman of the board of arbitration for the men's clothing industry in Chicago. He became widely known for his tact and perseverance in effecting conciliations between employer and labourer. In 1934–35 he was a member of the National Labor Relations board, and President Roosevelt again appointed him to the board Nov. 15, 1940 to succeed J. Warren Madden, the former chairman. He was elected chairman and sworn in Nov. 27. At the time of his appointment Millis was permanent conciliator between the United Automobile Workers' union and General Motors corporation. He was president of the American Economic association in 1934 and is the author of *The Japanese Problem in the United States* (1915) and *Sickness and Insurance* (1926).

Mineral and Metal Prices and Production.

The first of the accompanying tables shows the range of prices for the leading metals and minerals during 1940 on the New York

Table I.—*Mineral and Metal Prices in 1940*

New York market as reported by *E&MJ Metal and Mineral Markets*						London market as reported by the *Metal Bulletin* and *Mining Magazine*																							
										Open				High				Low				Close				Average			
Open	High	Low	Close	Average	Grade and Units		Grade	Units	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
20.00	20.00	17.00	17.00	18.961	99% (a)	Aluminium	98–99% *	Long ton	110	..	..	..	..	..	..	..	..	..	..	..	110	..	..	..	..	..
14.00	14.00	14.00	14.00	14.000	Domestic (a)	Antimony	Domestic, 99%	,,	87	10	..	99	..	..	85	..	..	85	..	..	85	..	..	..	..	..
16.50	16.50	16.00	16.00	..	Chinese (a)		Chinese	,,	87	..	..	98	..	..	87	..	..	87	..	..	90	..	..	..	..	..
3	3	3	3	..	.. (a)	Arsenic	Foreign	,,	30	..	..	30	..	..	30	..	..	30	..	..	30	..	..	..	..	..
1.25	1.25	1.25	1.25	..	.. (b)	Bismuth	..	Pound	..	$1.25	6	..	..	6	..	..	..	..	..	1½	..	$1.25	1½	..	..	..
75	80	75	80	79.920	48% (a)	Cadmium	48% Rhodesian	,,	..	5	..	..	5	..	..	5	..	..	5	..	172	5	..	..	..	..
27.00	35.00	27.00	33.00	..	97% (c)	Chromium, Ore	98–99%	Long ton	..	120	3½	..	172	6½	..	110	..	..	110	..	..	6	6½	..	..	..
85	89	85	89	..	4–6% C. (a)	Metal	4–6% C	Pound	38	3	..	..	3	..	..	3	..	..	3	..	..	3	..	..	..	..
11	11	11	11	..	.. (d)	Ferro-alloy	Fire refined 99.7% *	Long ton	45	..	..	..	..	..	38	..	..	..	..	..	45	..	..	..	..	..
12.275	12.275	10.275	11.775	11.296	Domestic (a)	Copper	Electrolytic	,,	46	..	..	..	..	..	..	..	..	..	..	..	61	..	..	..	..	..
12.375	12.40	9.80	10.20	10.770	Export (a)		Official	,,	62	..	..	..	..	..	..	..	..	..	..	..	62	..	..	..	..	..
35.00	35.00	35.00	35.00	35.00	.. (e)	Gold	50% No. African *	Ounce	..	168	..	..	..	..	..	..	..	..	..	..	..	168	nom.	..	..	..
4.95	4.95	4.45	4.45	..	Lower Lake ports (c)	Iron, Ore	Basic	Long ton	..	1	6	..	..	..	..	..	..	..	..	..	..	0	..	..	..	..
22.50	23.50	22.50	23.50	22.583	Basic (c)	Pig	80% R/C	,,	5	nom.	..	..	..	..	..	..	..	..	..	..	6	25	..	..	..	..
64.00	66.70	57.34	64.54	..	80%, Joplin, Mo. (f)	Lead, Ore	Foreign	,,	25	..	..	..	..	..	..	..	..	..	..	..	25	..	..	..	..	..
5.50	5.80	4.75	5.50	5.179	.. (a)	Metal	Ingots	Pound	..	1	6½	..	..	..	..	..	..	..	..	..	..	1	6	..	..	..
27	27	27	27	..	99.8% (a)	Magnesium	50–52%	Unit	..	1	2	..	..	..	..	..	..	..	..	..	..	1	2	..	..	..
45	51	45	49	..	46–48% Brazilian (g)	Manganese, Ore	..	Long ton	17	13	..	..	..	..	..	..	..	..	..	..	..	10	..	..	..	..
100	120	100	120	..	78–82% (c)	Ferro-alloy	..	Flask (76 lb.)	..	$150	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
145	200	145	165	176.865	.. (h)	Mercury	85–90%	Unit	..	50	..	60	..	..	48	..	..	48	..	..	..	..	..	..	..	..
45	45	45	45	..	90% (i)	Molybdenum, Ore	70–75% *	Pound	..	5	7	..	52	10	..	47	..	..	..	..	..	52	10	..	..	..
95	95	95	95	..	50–60% Mo. (d)	Ferro-alloy	Refined	Long ton	192	10	..	..	..	..	..	..	..	..	..	..	192	10	..	..	..	..
35	35	35	35	..	Cathodes (a)	Nickel	..	Ounce	..	10	..	..	..	..	..	..	..	..	..	..	..	10	..	..	..	..
24.00	24.00	24.00	24.00	..	.. (e)	Palladium	..	,,	5	10	..	9	10	..	8	10	..	5	10	..	5	15	..	..	..	..
40.00	40.00	36.00	36.00	37.924	.. (b)	Platinum	..	Pound	9	$1.72	..	..	..	..	..	..	..	8	..	..	8	$1.72	..	..	..	..
1.75	1.75	1.75	1.75	..	99.5% (j)	Selenium	Spot, bars	Ounce	..	..	22	..	..	23½	..	..	20⅛	..	..	..	..	..	23 5/16	..	..	..
34.75	35.025	34.75	34.75	34.773	.. (b)	Silver	..	Pound	..	nom.	..	..	..	..	..	..	..	..	..	..	..	7	..	..	..	..
1.75	1.75	1.75	1.75	..	.. (a)	Tellurium	Standard	Long ton	246	10	..	290	7	6	236	5	..	236	15	..	..	15	..	..	..	..
48.75	58.00	45.00	50.10	49.827	Straits (k)	Tin	..	Unit	..	50	..	..	..	..	..	..	..	..	..	..	..	50	..	..	..	..
23.00	25.50	22.00	23.75	..	Domestic (k)	Tungsten, Ore	65% *	Pound	4	nom.	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..
23.50	26.00	23.00	26.00	..	Chinese (d)	Ferro-alloy	80–85% *	Unit	..	..	..	..	..	..	..	..	..	..	..	..	..	nom.	..	..	..	..
205	195	195	195	..	75–80% (l)	Vanadium, Ore	10–12% V_2O_5 *	Unit	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
27.5	27.5	27.5	27.5	..	..																					

Due to changes in grades and standards, the operation of price control, and other factors incident to the war, annual averages are available for few commodities. All those starred are under price control, and data on high and low are of little significance; for several others highs and lows are not available, or are superfluous, there having been no change in price during the year.

(a) Cents per pound. (b) Dollars per pound. (c) Dollars per long ton, c.i.f. Atl[illegible] ports. (d) Cents per pound of primary metal content. (e) Dollars per fine [illegible] (f) Dollars per short ton. (g) Cents per long ton unit, c.i.f. Atlantic ports. (h) D[illegible] per flask, 76 pounds. (i) Cents per pound of contained MoS_2. (j) Cents per fine o[illegible] (k) Dollars per short ton unit. (l) Cents per pound of V_2O_5 contained.

Table II.—*World Mineral and Metal Production in 1939*

(Metric tons unless otherwise specified; Th. indicates thousands and Mi., millions of units.)

Country	Aluminium (Th.)	Bauxite (Th.)	Antimony (Th.)	Asbestos (Th.)	Cadmium (Th. Lb.)	Chromite (Th.)	Coal (Mi.)	Coke (Mi.)	Copper in Ore (Th.)	Copper (Blister) (Th.)	Diamonds (Th. carats)	Gold in Ore (Mi. Oz.)	Iron Ore (Mi.)	Pig Iron (Mi.)	Steel (Mi.)	Lead in Ore (Th.)	Lead (Th.)
geria	..	..	(1.0)	..	..	..	p	..	..	..	..	..	2.75	..	..	(4.4)	..
ngola	..	..	(0.6)	..	..	..	..	..	..	..	690.4	..	..	..	..	..	..
ustralia	..	..	..	0.2	390.6	(1.0)	17.5	(1.2)	23.6	20.2	(0.3)	1.62	2.70	1.10	1.22	..	252.4
elgian Congo	..	..	..	..	..	..	p	..	121.5	121.5	8344.8	0.49	p	p	..	..	..
elgium	..	..	..	..	1168.4	..	29.8	5.2	..	(81.5)	..	..	(0.18)	3.07	3.05	..	96
olivia	..	..	10.1	p	..	..	..	..	4.0	..	..	p	..	..	..	14.1	..
razil	..	10	..	p	..	(0.9)	1.0	..	..	..	P	0.29	0.40	0.15	..	..	..
urma	..	..	p	..	..	..	..	..	(55.8)	..	..	p	p	..	..	(89.0)	78.6
anada	75	..	..	330.2	939.7	..	14.1	1.8	281.5	229.3	..	5.10	..	0.84	1.41	176.3	172.9
hile	..	..	..	..	..	..	1.9	..	339.2	324.6	..	0.30	1.63	..	..	0.6	..
hina	..	..	6.8	..	..	..	P	P	..	p	..	P	..	0.70	..	p	P
olombia	..	..	..	..	..	..	(0.3)	..	..	..	..	0.57	..	..	..	..	..
zechoslovakia	..	..	P	P	..	..	(13.8)	(2.4)	p	p	..	p	P	1.0	1.27	(4.0)	P
rance	50	680	..	p	(255.7)	..	51	(7.8)	1	1	..	(0.09)	(33.13)	7.9	8.53	(4)	(43.6)
ermany	200	135	..	..	(952.4)	..	(385.1)	(43.5)	30	66	..	p	(13.54)	20.3	24.39	96.0	181.4
old Coast	..	..	..	..	..	..	..	..	..	..	1087.7	0.78	..	..	..	..	..
reece	..	180	..	..	..	55	(0.1)	..	..	..	..	..	(0.35)	..	..	P	(6.1)
uiana, Brit.	..	483.7	..	..	..	..	..	..	..	..	32.5	0.04	..	..	..	..	..
uiana, Neth.	..	504.0	..	..	..	..	..	..	..	..	..	0.01	..	..	..	..	..
ungary	2	570.2	..	..	..	..	(9.4)	p	..	..	..	p	(0.37)	0.5	0.76	..	p
dia	..	(15.0)	..	p	..	(44.8)	(29.5)	(1.7)	10.3	6.8	(1.7)	0.32	(2.81)	1.8	1.04	..	..
do-China	..	..	..	..	..	..	2.6	p	..	..	..	p	(0.13)	..	..	..	p
aly	30	380	(0.9)	(6.9)	(182.0)	..	2.5	(1.7)	p	2.8	..	p	(0.99)	1.0	2.39	(40)	38
apanese Emp.	23	..	..	(0.5)	P	P	P	..	77	110	..	(1.83)	P	3.2	6.40	(22)	22
uxembourg	..	..	..	..	..	..	..	..	..	..	..	..	(5.14)	1.8	1.83	..	..
alaya	..	93.7	..	..	..	..	..	p	..	..	..	0.04	(1.61)	..	..	..	..
anchoukuo	..	..	..	..	..	..	14	..	..	..	..	0.1	P	0.7	P	..	..
exico	..	..	7.9	..	1799.0	..	(0.9)	P	48.8	44.3	..	0.94	(0.12)	0.1	..	219.5	169.1
orocco, Fr.	..	..	..	..	..	..	0.1	..	..	..	..	p	(0.27)	..	..	17.1	..
eth. E. Indies	..	(245)	..	..	..	..	1.8	..	..	..	..	(0.08)	..	..	..	..	..
ew Caledonia	..	..	..	..	..	52	..	p	..	..	..	..	p	..	..	..	..
orway	31	..	..	..	(457.8)	(0.5)	..	..	19.4	10.5	..	p	(1.43)	0.2	..	0.1	(0.3)
eru	..	..	0.8	..	..	..	p	..	35.4	35.0	..	0.27	..	..	..	45.0	20.7
hilippines	..	..	..	..	..	126.7	p	..	5.2	..	..	1.00	(0.91)	..	..	..	..
oland	..	..	..	..	(539.9)	..	(38.1)	(2.5)	..	..	..	..	(0.87)	1.0	1.63	5.3	(18.6)
ortugal	..	..	..	..	..	..	0.3	..	..	..	..	p	p	..	..	..	0.8
hodesia, No.	..	..	..	52.9	..	..	..	..	216.0	215.1	..	p	p	..	..	3.0	2.8
hodesia, So.	..	..	..	..	..	139.1	1.1	p	..	..	..	0.80	..	..	..	..	..
iam (Thailand)	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
ierra Leone	..	..	..	..	..	..	..	..	..	..	(689.6)	0.03	(0.88)	..	..	..	..
outh Africa	..	..	..	19.9	..	160.0	16.9	(0.2)	11.0	10.3	1249.8	12.82	0.49	0.30	0.31	15.0	p
.-West Africa	..	..	..	..	158.6	..	..	..	..	..	35.5	p	p	..	..	..	4.3
weden	2	..	..	..	..	..	0.4	(0.1)	10.5	11.3	..	0.23	(13.93)	0.6	1.12	(8.6)	..
unis	..	..	..	..	..	..	..	..	..	..	..	..	(0.82)	..	..	17	23.4
urkey	..	..	0.6	0.7	..	210	2.8	(0.1)	4.6	5.9	..	p	0.24	..	..	(4.9)	..
nited Kingdom	25	..	..	11.0	275.4	..	236.7	(13.0)	..	(7.2)	..	p	(12.05)	8.3	13.72	(30.2)	10
nited States	148.4	381.3	0.4	(86)	4820.2	3.1	400.6	40.2	666.8	698.3	..	4.62	52.55	32.32	48.44	371.9	439.1
.S.S.R.	50	250	..	..	(250)	P	(132.9)	16.7	107	108	..	5	(26.53)	15.2	18.80	(69)	75
enezuela	..	..	..	p	..	..	p	..	..	..	..	0.15	..	..	..	..	..
ugoslavia	1.7	314.4	4.2	..	..	44.1	(0.4)	..	41.7	41.7	..	0.09	0.66	0.1	..	69	10.7
orld Total	660	3900	34	?	?	950	?	?	2162	2161	12400	39.82	?	102	137	(1792)	1700

Country	Magnesite (Th.)[1]	Manganese Ore (Th.)	Mercury	Nickel (Th.)	Petroleum (Mi.)	Phosphate Rock (Th.)	Platinum (Th.Oz.)	Potash (Th.)[2]	Pyrite (Th.)	Salt (Mi.)	Silver in Ore (Mi. Oz.)	Sulphur (Th.)[3]	Tin in Ore (Th.)	Tin (Th.)	Tungsten Ore (Th.)[4]	Zinc in Ore (Th.)	Zinc (Th.)
igeria	..	..	..	..	..	552.8	..	..	(44.2)	(0.07)	0.09	..	..	..	..	(7.0)	..
ngola	..	..	..	..	..	..	..	..	..	(0.03)	..	..	..	..	..	..	..
ustralia	(19.8)	(0.6)	0.1	..	..	p	0.3	p	(51.1)	(0.13)	13.68	..	3.3	3.3	(0.67)	(223.3)	70.8
elgian Congo	..	(7.7)	..	..	..	..	(0.2)	..	..	p	(3.11)	..	9.66	2.5	..	(4.0)	..
elgium	..	..	..	..	..	34.0	..	..	..	..	..	..	..	3.1	..	(3.0)	185.7
olivia	..	0.5	0.3	..	p	..	..	..	..	..	7.24	2.1	27.22	..	2.00	7.8	..
razil	..	193.0	..	p	..	p	..	..	..	(0.86)	0.03	..	..	..	p	..	..
urma	..	..	..	1.2	1.1	..	..	..	..	(0.04)	6.18	..	5.75	..	(3.53)	(55.8)	..
anada	..	0.4	0.2	95.5	1.0	p	148.9	..	209.1	(0.40)	23.12	..	..	..	..	179.0	159.3
hile	..	12.6	..	..	..	15	..	..	..	p	1.33	27	..	..	..	..	..
hina	..	p	2	..	..	8	..	p	..	3	P	..	10.86	10.6	6.95	(1.0)	..
olombia	..	..	..	..	3.3	..	39.1	..	..	(0.2)	0.24	..	..	..	..	..	..
zechoslovakia	(74.7)	..	(100)	..	p	..	..	..	P	(0.17)	(1.19)	..	..	..	..	..	(5.9)
rance	..	..	..	0.6	p	25.4	..	(581.8)	(147.2)	(1.61)	(0.57)	(0.1)	..	..	(0.13)	..	60.3
ermany	(439)	(0.1)	(60)	..	0.8	(2.5)	..	(1861)	(465.3)	(3.37)	(7.01)	..	0.30	3.7	..	(220)	212.3
old Coast	..	(329.4)	..	..	..	..	..	..	..	..	(0.02)	..	..	..	..	..	..
reece	(168.2)	(7.1)	..	(1.0)	..	..	..	..	(244)	(0.10)	(0.34)	p	..	..	..	P	..
uiana, Brit.	..	..	..	..	..	..	..	..	..	..	p	..	..	..	..	..	..
uiana, Neth.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
ungary	..	(22.2)	..	..	0.1	..	..	..	..	..	(0.05)	..	..	..	..	..	..
dia	(26.0)	(983.5)	..	..	0.3	p	..	(4.0)	..	(1.56)	(0.02)	..	..	..	p	..	..
do-China	..	2.4	..	..	..	30	..	..	..	(0.19)	p	..	1.39	..	0.33	(5.2)	5.3
aly	(6.2)	(48.3)	(2301)	0.2	p	p	..	(0.3)	(930.3)	(1.47)	(0.81)	(374.3)	0.23	..	p	(88)	33.6
apanese Emp.	..	P	(20)	..	0.4	231.8	p	..	..	1	(12.8)	P	1.7	2.0	P	(22)	55
uxembourg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
alaya	..	32.0	..	..	..	..	..	..	..	..	p	..	55.95	81.53	0.24	..	..
anchoukuo	(331)	..	..	..	..	..	..	..	(3.0)	..	p	..	..	..	..	..	..
exico	..	p	254	..	6.5	..	..	..	..	(0.11)	75.87	p	(0.25)	..	0.07	134.2	36.1
orocco, Fr.	..	(86.6)	..	0.2	..	1491.8	..	..	..	p	(0.28)	..	..	..	..	(2.5)	..
eth. E. Indies	..	(9.7)	..	0.5	7.9	(33.1)	p	..	..	(0.07)	(0.58)	(16.0)	31.28	14.79	p	..	..
ew Caledonia	..	..	..	7.6	..	5	..	..	..	..	..	..	..	..	..	..	..
orway	(2.1)	..	..	1.1	..	..	..	..	(1027.8)	..	(0.25)	..	..	..	0.01	(7.7)	45.0
eru	..	4.0	..	..	1.8	..	..	..	..	p	18.80	(2.9)	0.10	..	0.16	17	..
hilippines	..	(43.4)	..	..	..	p	..	..	..	(0.05)	1.25	..	..	..	..	..	..
oland	..	..	..	..	0.5	10	..	(109.3)	(92.2)	(0.64)	..	..	..	..	..	(70)	(108.1)
ortugal	..	(0.2)	..	..	..	..	..	..	673.0	p	(0.02)	..	1.36	..	2.40	..	..
hodesia, No.	..	3.0	..	..	..	..	..	..	..	..	0.06	..	p	..	..	(12.7)	12.9
hodesia, So.	..	..	..	p	..	..	..	..	27.4	..	0.17	..	0.45	..	0.16	..	..
iam (Thailand)	..	..	..	..	..	..	..	..	..	(0.16)	..	..	16.99	..	0.23	..	..
ierra Leone	..	..	..	..	..	..	0.1	..	..	..	p	..	..	..	..	..	..
outh Africa	(2.6)	419.7	..	..	..	p	47.1	..	29.8	(0.1)	1.18	..	0.48	..	0.06	..	..
.-West Africa	..	..	..	..	..	..	..	..	..	p	0.59	..	0.15	..	p	..	..
weden	..	(5.3)	..	..	..	(6.2)	..	..	(186.4)	..	(1.12)	..	..	..	0.11	(34.6)	..
unis	..	..	(9)	..	...	1827.7	..	..	..	(0.13)	..	..	..	..	..	(0.7)	..
urkey	(0.8)	3.3	15	..	..	..	..	..	..	(0.25)	0.58	(3.7)	..	..	..	7.5	..
nited Kingdom	..	..	..	0.4	..	..	..	..	(4.4)	(2.67)	(0.11)	..	1.71	38.8	(0.15)	(11.7)	50.4
nited States	88.0	29.8	642	..	171.1	3817.4	40.3	278.6	524.7	(7.3)	63.87	..	0.12	..	..	522.1	460.2
.S.S.R.	P	(2272.8)	(300)	3	29.5	1618	(170)	P	..	P	8.02	2091.0	..	..	..	(70)	(70)
enezuela	..	..	..	..	30.5	..	..	..	..	p	..	..	..	..	..	..	..
ugoslavia	39.3	5.7	..	..	..	p	..	..	127.0	(0.05)	2.57	..	..	..	..	41.7	4.1
orld Total	?	?	?	110.5	284.8	12050	(460)	2900	?	32	5.41	?	183.8	178.2	(21.33)	(1867)	1620

NOTES: A figure in parentheses is for the preceding year, 1939 data not being available. A figure without decimals or less than the normal number is an estimate, except with mer-
y. The letter "p" indicates a small production unknown or smaller than the minimum base of the table, while "P" indicates an unknown output of greater size.
Crude magnesite. [2]K_2O equivalent of salts produced. [3]Mainly crude sulphur, but includes some ore, where sulphur content is not reported; also includes some sulphur
overed from industrial gases, especially from the roasting of sulphide ores. [4]WO_3 content of concentrates produced.

and London markets. In the United States, although some prices advanced, these were largely confined to imported goods, for which freight and insurance rates increased materially. The *Engineering and Mining Journal* index of nonferrous metal prices declined from 80·85 in Jan. 1940 to 77·19 in April, rose to 78·85 in June, declined again to 76·71 in August, advanced to 83·14 in November, and dropped to 82·42 in December; the average for the year was 79·22, against 77·71 in 1939 and 90·86 in 1937, the last year in which conditions were at all comparable. The open market prices for many of the more important commodities in the London market have been replaced by a controlled price, which sets the maximum beyond which the market may not go.

Table II gives such data as were by January 1, 1941, available on mineral and metal production in 1939 for the leading commodities and the more important producing countries. However, many of the figures are estimates, and others are lacking. The *Statistical Summary* of the Imperial institute, from which this table is usually compiled, did not appear in 1939, and the data presented were accumulated from a number of sources, mainly *Mineral Industry, Minerals Yearbook, Yearbook of the American Bureau of Metal Statistics,* and the *Statistical Yearbook of the League of Nations.* The *Mineral Industry* index for the aggregate world mineral production rose in 1939 to a new high at 152, as compared with 139 in 1938 and the former high of 150 in 1937. The chief items contributing to the rise were petroleum, pig iron, copper, zinc, aluminium and tin. (G. A. Ro.)

Mineralogy. Because of the disturbed international conditions, the scientific activities of some European mineralogists were curtailed. During 1940 five new minerals were described: montgomeryite, bellingerite, sterrettite, pararammelsbergite and clinobarrandite (*American Mineralogist,* May, August, September, November). Spencer published the 15th list of new mineral names, with an index of authors (*Mineralogical Magazine,* September). The following meteorites were described: the Bartlett, Bell county, Tex., by Bullard; the Lubbock, Lubbock county, Tex., by Waldschmidt; the Shallowater, also Lubbock county, Tex., by Foshag (*American Mineralogist,* July, August, December); the Boxhole meteoritic iron, central Australia, by Madigan; the Tauq, 'Iraq, by Macfadyen and Claringbull (*Mineralogical Magazine,* March, September). Extensive studies were reported on ceramic clay in Hawaii by Wentworth, Wells and Allen (*American Mineralogist,* January); on the crystal chemistry of certain phosphates, arsenates and vanadates by Richmond (*ibid.,* July); on the classification of minerals of the type $A_3(XO_4)_{2\cdot n}H_2O$ by Wolfe (*ibid.,* November, December); on the structure of orthoclase by Chao, Hargreaves and Taylor (*Mineralogical Magazine,* March); on colloidal gold as a colouring principle in minerals by Friend and Allchin (*ibid.,* September). New refractometers using the diamond and other minerals were described by Anderson, Payne and Pike (*ibid.,* September).

Gem Minerals.—Ball reviewed extensively the diamond industry and stressed the increased use of industrial diamonds (*Jewelers' Circular-Keystone*). Inclusions in gem-stones were discussed in detail by Bach (*Gemmologist,* London, January, February, March, April).

Roebling Medal.—At the annual meeting of the Mineralogical Society of America held at Austin, Tex., Dec. 26, the third Roebling medal of the society was awarded to the distinguished British mineralogist, Dr. Leonard J. Spencer of London, England. Dr. Spencer was long associated with the mineral department of the British museum and since 1900 he has been editor of the *Mineralogical Magazine,* issued by the Mineralogical Society of Great Britain. He is author of many books and scientific articles.

Necrology.—Four prominent mineralogists, all fellows of the Mineralogical Society of America, died during 1940. Dr. W Brøgger of Oslo, Norway, died Feb. 17, age 89. Dr. Brøgger an authority on Norwegian rocks and minerals. He had serve professor of mineralogy and geology at both the University Stockholm, Sweden, and at the University of Oslo. Since 1917 was professor emeritus of the latter institution. Lazard Ca vice-president of the Mineralogical Society of America in 1 died May 23, age 75. He was widely known as a collector of, dealer in, minerals. In 1927 a new boro-arsenate of calcium named Cahnite in his honour. John Eliot Wolff, president of Mineralogical Society of America in 1934, died Aug. 9, age Professor Wolff was largely responsible for the development the department of mineralogy and petrography of Harvard univ sity where he served in various academic ranks from 1887 1923, when he became professor emeritus.

Philip Krieger, mineralogist and mining engineer and staff m ber of the department of geology, Columbia university, Aug. 18, age 40.

(*See* also MINERAL AND METAL PRICES AND PRODUCTION.)

(E. H. KR.)

Mines, Marine: *see* SUBMARINE WARFARE.

Miniature Photography: *see* PHOTOGRAPHY, MINIAT CAMERA.

Mining: *see* MINERAL AND METAL PRICES AND PRODUCTION; also under separate minerals.

Minnesota, a north central state of the United States, po larly known as the "Gopher State," has an a of 84,682 sq.mi., of which 3,824 are water. Population, U census of 1940, 2,792,300, an increase of 228,347 since 1 This increase of 8·9% compares with the 1920–30 increase 7·4%. Capital, St. Paul, 287,736. The only city in the st with a larger population was Minneapolis, 492,370. Duluth 101,065.

History.—The state division of employment and security ported an estimated $40,000,000 increase in pay rolls through the state for 1939 over 1938. Increased confidence of Minnes business resulted in 20,000 new jobs during the past two ye according to Governor Harold E. Stassen in his review of labour program for 1940.

In the first 14 months, from April 1939 to June 1940, follow the passage of the labour conciliation law, 39 strikes resulted fr a total of 553 notices given, and wage losses from strikes in M nesota were cut in half. Labour disputes affected a farm im ment machinery company, a power company, metal produ laundries, ice cream companies, a refrigerator company and n foundries in the state. The federal government intervened settling the refrigerator strike so that work could proceed national defence contracts. WPA spent an estimated $44,637, in Minnesota in 1940, giving work to a monthly average of 39, persons. Joseph H. Ball was appointed to fill the vacancy in senate caused by the death of Ernest Lundeen. Ernest L. Ol was appointed co-ordinator for the State Defense Industrial c mission. Governor Stassen was selected to give the keynote dress at the Republican National convention held in June.

From Minnesota 328,987 men registered under the select service law. The gross quota for the first year of conscript was 38,021, the net quota of 18,652 men to be furnished June 30, 1941.

In the November presidential election Roosevelt (Dem.) cured 644,196 votes, Willkie (Rep.) 596,274; Thomas (S 5,454; Browder (Com.) 2,711; Aiken (Ind.) 2,553. Gover Harold E. Stassen was re-elected by a plurality of 200,000 vo Senator Henrik Shipstead, who withdrew from the Farmer-La

ty to join the Republican ranks, won a fourth term by a major- which approached 300,000. Republicans elected their entire te ticket and eight of the nine congressmen. Elmer Ryan, who for re-election as congressman on the Democratic ticket, was eated after having carried the second Minnesota district three es. He opposed President Roosevelt on the third-term issue. e Farmer-Labor party ranked second in the voting on state ces, but the Democrats increased their strength to a marked ree. Conservatives had strong control of both houses of the te legislature as a result of the fall election. Officers the state were: Governor, Harold E. Stassen; lieutenant ernor, C. Elmer Anderson; secretary of state, Mike Holm; asurer, Julius A. Schmahl; auditor, Stafford King; attorney eral, J. A. A. Burnquist; chief justice, Henry M. Gallagher.

Education.—Minnesota school enrolment for 1939–40 was ,571 pupils, 22,177 teachers; total public school expenditure anced from $52,004,084 to $52,287,794. The University of nnesota had a regular enrolment of 15,871 students in 1940, l a grand total of 26,383 students, including all branches and sions. It ranked second in the United States in enrolment. nnesota's educational system numbered 10 colleges in addition the state university, 654 high schools, and six state teachers' leges.

Charities and Correction.—The department of social security l general control in 1940 over 19 state institutions and super- on of 14 county tuberculosis sanatoria. About 62,850 pension- received a total of $1,321,085 in old-age assistance, or an rage of $21.02 per person. About 3% of the recipients of -age assistance relinquished it because of the homestead lien vision which became effective Jan. 1, 1940. As a result the te cost was reduced about $10,000 a month.

Banking and Finance.—On June 30, 1940 there were 484 state ks with deposits of $285,896,644 and 188 national banks with osits of $750,180,000 and resources of $833,476,000. The net te debt on Dec. 31, 1940 totalled $119,005,775, a reduction more than $11,000,000 during the past 18 months.

Agriculture, Manufacture, Mineral Production.—In 1939 nnesota had 178,341 farms, with a total area of 30,423,719 ac. cording to the United States Bureau of Agricultural Economics, nnesota led the northwest in farm income gains that were gen- l for the whole region, in the first ten months of 1940. rmers in this period scored gains of more than $55,000,000— largest amount for any state over the same period in 1939. e gain in livestock and livestock products' sales increased re than $8,000,000 in the first half of 1940. Gross income m crops, $88,188,000; from livestock, $244,578,000. The 1940 duction of barley in Minnesota was 58,232,000 bu.; rye, 50,000 bu.; flaxseed, 12,230,000 bu.; hay, 4,732,000 tons; oats, 7,848,000 bu. Minnesota was third in the U.S. in spring wheat duction with 34,215,000 bu. It led all states in the production creamery butter with 297,325,000 lb. in 1939. It was second production of milch cows and heifers and third in cattle.

Improvement in domestic, industrial and business activity was th a cause and a result of improved farm income. Numerous w industries were introduced, among them soybean and flax re. Wages paid Minnesota employees who were covered by the employment compensation law, rose 7% in 1939 to $497,862,- 1, an increase of $32,000,000 over 1938. Manufacturing led de to become the largest Minnesota industry among those re- rted. Industries showing largest increase were construction, up % over 1938, and mining and quarrying, which rose 19% in 39. Of the nation's iron ore supply for 1939, 62% came from innesota mines. Fifty million tons of iron ore were produced in innesota in 1940. Total building and construction contracts re at the highest point since 1934. In nonagricultural establishments, 542,000 persons were employed, an increase of 1·7% over 1939. Minnesota received about $30,000,000 of initial defence orders, or about 1% of the total.

BIBLIOGRAPHY.—*See* Minnesota *Legislative Manual,* 1939; *Minnesota Year Book,* 1940 supplement, and 1939, issued by the League of Minnesota Municipalities; William W. Folwell, *History of Minnesota,* 4 vols., Minnesota Historical Society (1922–30); T. C. Blegen, *Building Minnesota* (1938), and *Minnesota: Its History and Its People,* a syllabus, University of Minnesota Press (1937); *Minnesota: A State Guide,* Federal Writers' Project (1938). (T. C. B.)

Minnesota, University of. The university experienced a further increase in enrolment and for the 1939–40 fall quarter again ranked second among American universities in regular collegiate enrolment. The net total enrolment for the year ended June 30, 1940 was 38,306, of whom 16,767 were women. Opened for use in the fall of 1940 for the first time were Ada Comstock hall, the new women's dormitory, and the $2,000,000 Coffman Memorial union. The three upper floors of this new student union building house the Campus club, an organization in which membership is restricted to staff members. The remainder, constituting the major portion of the building, provides for the first time adequate social and recreational facilities for men and women students on an equal basis. Heretofore such facilities on a limited basis were provided separately in different buildings for men and for women. Buildings completed and put into service during 1939–40 were the journalism building, the museum of natural history and farm campus student health service building. Construction was begun on a field crops building for the farm campus. Dr. Theodore C. Blegen, professor of history, was advanced to the post of dean of the graduate school to fill the place made vacant by the death of Dr. Royal N. Chapman. (G. S. F.)

Minorities. The importance of minorities has grown in the 20th century with the spread of democracy and of the ideal of self-determination of all peoples. The existence of national minorities and their dissatisfaction with the situation had been one of the factors leading to the war of 1914–18. The Ottoman empire until 1913, the Austro-Hungarian monarchy and the Russian empire were outstanding examples of states containing national minorities which were dissatisfied. Germany had in its Polish provinces, in Schleswig and in Alsace-Lorraine, Polish, Danish and French minorities who longed for their liberation. In western Europe, the Irish in the British Isles, the Catalans in Spain and the Flemish in Belgium presented similar problems. Subsequently the Irish and Flemish problems were solved by the political developments in Great Britain and Belgium, and the peace treaties of Paris in 1919 reduced considerably the number of minorities under alien domination in central Europe. The frontiers drawn corresponded more faithfully to the ethnical conditions than the prewar situation did. Many small nationalities who had been deprived of their independence for a long time, regained it. For historical, economic and strategic reasons, however, the new frontiers left large minority groups outside the countries where their co-nationals formed the majority of the population. In view of the impossibility of creating ethnographically clear-cut boundary lines, the peace treaties devised a new and progressive system of protection for racial, linguistic and religious minorities through the League of Nations, so as to assure to the remaining minorities equality of treatment in the new states, where also the newly introduced democratic constitutions gave to all inhabitants full civic rights and equal status. This system of protection for the minorities broke down with the weakening of the League of Nations and with the advance of anti-democratic forms of government in central Europe. In 1939, together with the League of Nations and with some of the new states which had re-

THE UNITED STATES WATCHED its Japanese minority in California with extra care in 1940 as tension developed between the two countries. Many real estate owners prohibited Japanese from buying or occupying land

gained their independence in 1918, the system for the protection of minorities collapsed. Since then several other nations have followed Czechoslovakia and Poland in the loss of their independence; in the chaos which national socialist influence and conquest spread over Europe the minority problems gained in urgency, and many found themselves exposed to systematic atrocities without parallel in modern European history. All protection and all democratic guarantees for minorities were destroyed. Germany's aggression resulted in a situation for the minorities infinitely worse than that which had existed in the years before 1938 and definitely worse than that before 1914. National socialist Germany planned to reorganize Europe, not on the basis of the equality of all peoples and with an international protection for minorities, but on a hierarchical basis in which the German race would everywhere have the fullness of rights, while other peoples would be only subordinated according to the will and desire of the German master race, and minorities would be protected, if at all, by Germany alone and according to its conceptions of the worth and value of each individual people and each individual minority.

These new principles were clearly applied in Poland and in Bohemia and Moravia. The annexation of Czechoslovakia in March 1939 had put 7,000,000 Czechs, without any guarantee of their rights or liberty, under the national socialist regime with its peculiar concepts of law, liberties and racial equality. The conquest of Poland brought about 20,000,000 Poles under German domination. The national socialists proclaimed openly the racial inferiority of the Poles, who therefore were denied equal treatment with the German master race. All Poles were forcibly ejected from those large parts of Poland which Germany wished to annex outright. In the other districts they were allowed to continue to exist as a helot race performing subordinate economic functions, but deprived of higher education, of the possibility of forming a leader class and of any opportunity for economic or social rise. Thus they were to be prevented from ever again asserting their national aspirations or rights and were to be transformed into a denationalized and subservient mass with no will to resistance. The theory of racial inequality with all its consequences, first applied only to the Jews, was applied to other helpless nationalities as well.

During 1940 the soviet union annexed some of the territories which had formerly belonged to Russia. Lithuania, Latvia and Estonia thus lost their independence which they had gained in 1918. The occupation of southern Finland, of Bessarabia of northern Bukovina added to the new populations which been brought within the soviet union by the occupation of eas Poland in Sept. 1939. In conformity with its principles of ra equality, the populations incorporated into the soviet un were treated on a footing of equality and were granted guistic autonomy, but they were subject to a complete comm zation of their political, social and cultural life, and thus ordinated with the regime existing throughout the soviet un While the soviet union is organized not as a national or ra state, but as a supra-national state on the basis of a fed tion of equal national republics, the minorities within the so union cannot be regarded as minorities in the technical se of the word.

The new frontiers in central and eastern Europe brought German minorities there under new governments. While Germ wished the German minorities living in Slovakia, Hungary Rumania to remain there, to enjoy special privileges and to as guardians of national socialist interests and influence tried to remove all the German minorities from territories un the soviet union. These German minorities, although they lived in these homelands often for centuries, were forced migrate to Germany and were resettled mostly in parts which formerly belonged to Poland or to Czechoslovakia, in an effort Germanize these districts.

The dismemberment of Rumania did not solve any mino problem. Bessarabia, which was ceded by Rumania to the so union, had a predominantly Rumanian peasantry, although th were large Ukrainian minorities, while northern Bukovina, wh shared Bessarabia's fate, was predominantly Ukrainian. The c sion of southern Dobruja to Bulgaria brought a large Bulgar minority back into Bulgaria. The treaty of Craiova between R mania and Bulgaria foresaw the exchange of the Rumanian min ity remaining in southern Dobruja for the Bulgarian minority the northern Dobruja. The partition of Transylvania betw Hungary and Rumania did not solve any minority problem; it l a small Hungarian minority in Rumania and created a large R manian minority in Hungary and exacerbated the feelings of Rumanians. Through the gain of territory in the last two ye Hungary received considerable Slovak, Ukrainian and Ruman minorities and increased her own German minority. Yugosla was able to solve her most outstanding minority problem, that the Croats, by accepting the principle of complete equality Serbs and Croats and granting the Croats a wide measure of tonomy; foreign influences, however, kept alive an extremist irredentist movement among a small section of the Croatian p ple, so as to disintegrate Yugoslav unity. The Italians used Albanian minority in the Greek Epirus as a pretext in their pro ganda against Greece preceding the invasion of that country. T German conquest of the Low Countries and of France made so dormant minority problems more acute. The Germans favou the Flemish nationalists in Belgium and even seemed to supp for a brief time a Breton independence movement against Fran Lorraine was annexed to Germany, and the French-speak population as well as all those in sympathy with France w expelled from the country, which was quickly co-ordinated w national socialist Germany and settled by immigrants from G many. The victory of General Franco in Spain was inimical to minorities there, especially the Catalans and the Basques, wh autonomy was taken away and who were subjected to a ruthl process of forced assimilation. The use of the Catalan and Basc languages was strictly forbidden. Throughout Europe, as far national socialist influence reached, the status of the Jewish min ities became more and more tragic; they found themselves fac with the threat of complete annihilation. Especially catastrop

the situation in Poland. The forced migration of persecuted s threatened to assume unprecedented dimensions, but it was in check by the difficulties imposed upon travel as a result war conditions. Throughout the world the experience of the in 1940 and National Socialist propaganda tended to create minority problems and to accentuate existing ones on account he fear of their possible use as "fifth columns." With the d deterioration of international law and morality, the problem minorities became increasingly acute. (For fuller figures on s, *see* JEWS, DISTRIBUTION OF.) (H. KO.)

nor League Baseball: *see* BASEBALL.
nt, United States: *see* COINAGE.
quelon: *see* FRENCH COLONIAL EMPIRE.
sions: *see* FOREIGN MISSIONS.

ssissippi, admitted as a state in 1817; popularly known as the "Bayou State"; area, 46,810 sq.mi.; population (U.S. census, 1940), 2,183,796; capital, Jackson, 62,107, est city in the state. Of the state's population in 1940, 882 were urban, or 19·8%. In 1930 there were 1,000,103 es; 1,009,718 Negroes; 1,999,429 native born; 7,145 foreign.

istory.—The state of Mississippi votes solidly the Democratic et. In the presidential election the following votes were : Democratic balloting, 168,267, regular Republican, 2,814, ependent Republican, 4,549, Socialist, 193.

or 1940–44 principal officers of the state are: governor, l B. Johnson; lieutenant-governor, Dennis Murphree; secre- of state, Walker Wood; attorney-general, Greek L. Rice; e tax collector, Carl N. Craig; state treasurer, Lewis S. ; superintendent of education, J. S. Vandiver; presiding er of the state senate, lieutenant-governor, Dennis Murphree; iding officer of the house of representatives of the state, E. Lumpkin. The state senate has 49 members in addition to presiding officer, the lieutenant-governor. The house of esentatives has 140 members. In the membership of the state slature farmers predominate with a total of 67 in the two ses; lawyers, 59; teachers, 23; merchants, 9; insurance agents, vith 13 other occupations represented in the membership with n five to one member. All members of the legislature are nbers of the Democratic party.

ducation.—The state maintains two systems of public ols, one for whites and one for Negroes, as required by the stitution. Consolidation of rural schools has been very exten- since 1930, the rural schools of all 82 counties of the state ing been to some extent consolidated.

anking.—There are in the state 182 state banks, including branch banks, and 24 national banks, including one branch k. Bank resources stood at $227,509,327.34 on June 29, 1940, deposits at $198,963,260.96.

griculture and Manufactures.—Agriculture provided direct ployment for 66·8% of the state's total population. Sixty-six cent of the total land area of the state is used for agricultural poses, there being 311,683 farms covering 19,655,413 ac. in 9, with a crop output of $134,493,000, of which $76,589,000 cotton and $12,282,000 was cottonseed.

Manufacturing in recent years has developed very rapidly, parlarly manufacturing having to do with the use of cotton and use of wood products. (A. B. BU.)

ssouri, second state carved from the Louisiana Purchase, admitted to the union in 1821, popularly known as "Show Me" state, occupies a central position in a group of states which comprise the great agricultural plain of the ssissippi valley.

Area, 69,420 sq.mi.; population (U.S. census, 1940), 3,784,664, a 4·3% increase over 1930. Capital, Jefferson City, 24,268. Largest cities (1940): St. Louis, 816,048; Kansas City, 399,178; St. Joseph, 75,711; Springfield, 61,238. Aliens (1940), 42,049.

MISSOURI'S NEW REPUBLICAN GOVERNOR, Forrest C. Donnell, elected Nov. 5, 1940

History.—During 1940 Missouri was the scene of several political battles. They began when U.S. Senator Clark clashed with Governor Stark for control of the Democratic state convention held on April 15. Clark was the victor; the convention, dominated by the Dickmann-Hannegan machine, the "courthouse rings," and the remnants of the Pendergast machine, adopted a platform barely mentioning Stark's administration. The same factions were again victorious in the Democratic primary on Aug. 6, as a result of a split in the anti-machine forces. Governor Stark and former U.S. District Attorney Milligan, who were principally responsible for crippling the Pendergast machine in previous years, both entered the senatorial race and were defeated by the machine candidate, U.S. Senator Truman, incumbent. During the campaign preceding the general election in the fall, the principal contest for state offices was for the governorship. On election day, Nov. 5, the Republican candidate, Forrest C. Donnell, received the support of his own party and of a considerable number of anti-machine Democrats, and, according to official returns, defeated the Democratic candidate, Lawrence McDaniel, by a plurality of 3,613 (Donnell 911,530, McDaniel 907,917). The legislature challenged the accuracy of these returns (Jan. 1941), delaying the inauguration. The rest of the major state officers elected were Democrats: Frank G. Harris, lieutenant-governor; Dwight H. Brown, secretary of state; Forrest Smith, auditor; Wilson Bell, treasurer; Roy S. McKittrick, attorney-general. Twenty-eight Democrats and six Republicans were elected to the state senate, and 85 Democrats and 65 Republicans to the house of representatives. A constitutional amendment was adopted, providing for the establishment of a nonpartisan system for the nomination, appointment and election of judges of certain courts.

The popular vote for president was Roosevelt 958,476, Willkie 871,009; for U.S. senator, Truman (Dem.) 930,775, Davis (Rep.) 886,376. The congressmen elected were 10 Democrats and 3 Republicans.

Education.—For the school year ending June 30, 1940 the public school system consisted of the University of Missouri, Missouri School of Mines and Metallurgy, five state teachers colleges, Lincoln university (Negro), schools for the deaf and blind, Negro vocational school, 9,417 elementary schools and 943 high schools. For the same period there were 506,173 pupils and 18,311 teachers in elementary schools and 198,864 pupils and 8,058 teachers in high schools; total disbursements of the school districts were $56,620,150.

Charities.—During Aug. 1940 public assistance and public work earnings amounted to $7,627,884. In November old-age assistance for 106,746 persons averaged $14.96. Unemployment compensation payments from January through Nov. 1940 totalled $6,667,057. During the same period the Missouri State Employ-

ment service placed 78,215 in private industry (27·9% increase over same months of 1939) and 8,869 in public employment. To meet the crisis caused by the exhaustion of the general relief fund, the legislature convened in special session (July 22–27, 1940) and appropriated $1,500,000, just enough for the remainder of the year.

Finance.—The balance in the state treasury on Dec. 31, 1938 was $21,226,021.10; receipts for 1939, $93,328,761.62; disbursements 1939, $93,446,420.27; balance in state treasury Dec. 31, 1939, $21,108,362.45. The total state bonded indebtedness on Dec. 31, 1939 was $103,255,000; on Dec. 31, 1940, $96,483,000.

Agriculture, Manufactures, Mineral Production.—In 1939 Missouri had 217,520 farms with a total acreage of 35,371,000, of which 15,264,000 ac. were devoted to crops and 15,445,800 to pasture. In 1938 it ranked fourth among the states in number of hogs on farms, fifth in horses, eighth in cattle, ninth in mules, and 11th in sheep; seventh in quantity of corn, oats, and grain sorghums produced, eighth in winter wheat, and 11th in tame hay. In 1937 Missouri ranked 10th among the states in number of manufacturing establishments, 12th in value of products and in amount of wages and 13th in number of wage earners. The value of the state's mineral products for 1938 was $39,560,739. In the same year Missouri's place among the states was first in value of lead and barite produced, second in chats, third in lime and fourth in raw clay. During 1939 Missouri produced 156,281 tons of lead, which was 37·8% of the total output in the U.S.

(R. P. Br.)

Mix, Tom (1880–1940), U.S. motion picture actor, was born in El Paso county, Texas, Jan. 6. He worked as a cowboy in Texas, Arizona, Wyoming and Montana and served with the U.S. army in the Philippines, in the Spanish-American war and during the Boxer rebellion in China. Later he served in the British army during the Boer war in South Africa. He was a deputy sheriff in Oklahoma and served with the Texas Rangers for three years. He began to act in motion pictures in 1910, playing the part of a rough-riding hero. In 1933 he organized the Tom Mix circus and wild west show, after he had been with the Sells Floto circus. He died in Florence, Ariz., Oct. 12, in an automobile accident.

Modjeski, Ralph (1861–1940), U.S. engineer, was born in Cracow, Poland, Jan. 27, and died in Los Angeles, Calif., June 26. For a biographical sketch see *Encyclopædia Britannica,* vol. 15, p. 642.

Mohammedanism: *see* Islam.

Molotov, Vyacheslav Mikhailovich (1890–), Russian statesman, was educated at Petersburg polytechnic and during his youth organized bolshevik student groups and worked for the newspaper *Pravda.* February of 1917 found him a member of the Petrograd soviet executive committee. In 1920 he was appointed secretary of the central committee of the communist party of the Ukraine, and in the following year he held this office for the whole of the U.S.S.R. He was appointed president of the Soviet of People's Commissars in 1930 and continued to hold the office of premier after he was named foreign commissar May 3, 1939 to succeed Maxim Litvinov. The latter appointment foreshadowed the radical shift in soviet foreign policy which led to the nazi-soviet pact of non-aggression, signed by Molotov in Moscow, Aug. 24, 1939. Upon the outbreak of war a week later, Molotov entered upon a furious period of diplomatic activity that continued throughout 1940. On several occasions during the year, notably in his speeches of March 29 and Au before the supreme soviet, Molotov reaffirmed Russia's peac intentions and criticized the Allies for their "imperialist w A highlight of that year was his visit to Hitler in Berlin Nov and 13. On his 50th birthday, March 9, he was eulogized by soviet press, and two cities and districts were named for (*See* Union of Soviet Socialist Republics.)

Molybdenum. The United States is the foremost produce molybdenum, with about 87% of the wo recorded production to date, and a current output of about of the total. Australia, Chosen, Japan, Spain and Sweden contributed in the past, but are no longer active; Norway long been a producer, but contributes only 3% of the current put, while Mexico, which first produced in 1932, now supplies Morocco, beginning in 1933, now adds another 1%, and var smaller producers the same amount, making a total of 15 metric tons in 1939 against 16,340 tons in 1938, the first in output since 1932. (G. A. Ro

Monaco. A principality on the Mediterranean coast, boun on the land side by French (unoccupied) territ Area 375 ac. (0·59 sq.mi.); pop. (1939), 23,975. Chief tow Monaco, La Condamine, Monte Carlo; ruler: Prince Louis language: French. The chief occupation is catering for visit who, before the days of the war of 1939, numbered more 2,000,000 annually.

Monetary Units of Leading Countries: *see* Exchan Control and Exchange Rates.

Mongolia (Inner and Outer) is a vast sparsely popula tableland, arid and desert in stretches, occupy about 1,000,000 sq.mi. in northeastern Asia. It is bounded the north by Siberia, on the east by Manchoukuo, on the west Sin Kiang (Chinese Turkestan), on the south by China Pro Of these two parts of Mongolia, Outer Mongolia (622,744 sq. is greater in size; but Inner Mongolia (334,100 sq.mi.), includ the Chinese provinces of Chahar, Suiyuan and Ningsia, is m thickly populated. It is estimated that the population of O Mongolia consists of 750,000 Mongols and 100,000 others (mo Russians and Chinese), while there are about 1,500,000 Mon in Inner Mongolia.

History: *Inner Mongolia.*—During the '20s of the present tury this region was the scene of a constant struggle betw the Chinese farmers, who were moving into the country f more crowded parts of China and beginning to cultivate the l and the Mongols, who wished to reserve the land for pasture further element of friction and confusion was created beca Mongol princes in some cases alienated tribal lands, with do ful legality, to wealthy Chinese, sometimes government offic who then proceeded to parcel out the land for colonizat This element of chronic dissension between the Mongols and Chinese favoured the expansionist plans of the Japanese a Soon after the establishment of Manchoukuo, Japanese influe began to spread into Inner Mongolia.

For a time the chief political force in that region was the M golian Autonomous Political council, headed by Prince Teh, tried to hold a balance of power between the Japanese and Chi and to assure his own people as much independence as poss

This situation came to an end when the Japanese invaded N China in force in 1937. Prince Teh had little alternative ex to cast in his lot with the invaders. He ultimately became head of the so-called Autonomous Government of Mong established with headquarters at Suiyuan in Oct. 1937. This

ie is provided with Japanese political and military advisers. ier autonomous regimes under strong Japanese influence were up in the leading industrial and trade centres of Inner Mon- ia, Tatung, located in the midst of the vast coal fields of rth Shansi, and Kalgan, in South Chahar. Japanese monopolist anizations have taken over the Mongolian wool trade.

Outer Mongolia.—The republic of Outer Mongolia was set up a direct result of the invasion of the country by soviet troops, o were pursuing the far eastern Russian "White" leader, ron Ungern-Sternberg, who had utilized Outer Mongolia as a e of operations against Siberia. With this soviet aid a so- ed People's Revolutionary government was established in Urga w renamed Ulan Bator) and soviet influence has been so minant in the country since that time that very few foreigners e been able to visit it. According to the constitution of Outer ngolia, power is vested in a parliament called the Great ruldan.

Trade and cultural contacts have been exclusively with the viet Union and soviet institutions have been implanted in Outer ngolia, with modifications made necessary by the pastoral non- ustrial character of the country and the ownership of much of land by lamaseries, or monasteries inhabited by the lamas. viet anti-religious and agrarian policies could not be applied hanged in Outer Mongolia; a drive for collectivization which s pressed between 1929 and 1932 led to uprisings and a flight some of the Mongols across the frontier into Inner Mongolia. ere was then apparently a mitigation of this policy; but in- endent information about developments in Outer Mongolia is nost nonexistent.

After the Japanese occupation of Manchoukuo there were iodic border skirmishes between Manchoukuo and Outer Mon- ian troops, mostly in the vicinity of Lake Buir. Some of these nflicts assumed a more serious character, especially in the monhan region in the summer of 1939, when Japanese and viet aeroplanes and tanks were brought into action.

There is an air line between Ulan Bator and Verkhne-Udinsk, Siberia and a highway between Ulan Bator and the Siberian ntier town of Kyakhta and a small railway has been built to ilitate the working of coal mines near Ulan Bator.

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ontana, a northwestern State of the United States admitted Nov. 8, 1889, popularly known as the "Treasure te"; area 146,572 sq.mi. (third largest in the union); popula- n according to the U.S. census of 1940, 559,456, a percentage n of 4·1 and a numerical gain of 21,850 since 1930. Capital, lena, 15,056, which is the fifth city in size in the state. her cities of 10,000 or more are: Butte, 37,081; Great Falls, 928; Billings, 23,261; Missoula, 18,449; and Anaconda, 11,004. the state's population, 211,535 are urban, or 37·8% as com- red with 33·7% in 1930; and 16,583 are Indians.

History.—In the quadrennial election of 1940, Sam C. Ford s elected governor (first Republican governor in 20 years), th a Republican senate and a Democratic house of representa- es. Other state officers elected were Ernest T. Eaton (Rep.), utenant governor; Sam Mitchell (Dem.), secretary of state; hn J. Holmes (Dem.), state auditor; Thomas Carey (Dem.), te treasurer; John W. Bonner (Dem.) attorney general; izabeth Ireland (Rep.), state superintendent of public instruc- n; Paul T. Smith (Dem.), railroad commissioner.

Jeannette Rankin (Rep.) and James F. O'Connor (Dem.), were cted representatives to congress. Senator Burton K. Wheeler em.), was chosen for a fourth term in the United States senate. President Roosevelt carried the state with a vote of 145,698 against 99,579 for Willkie; 1,443 for Thomas; 664 for Babson and 489 for Browder.

Education.—There are (1940) about 75 city and public libraries in the state, over half of which are tax supported. In 1939–40, the public schools, with a budget of approximately $13,500,000, enrolled 74,791 pupils in the grades and 32,045 in the high schools. The six units of the University of Montana had an income of $1,680,111 and a total registration of 5,454. In the 1940 election by legislative referendum the 1930 3-mill special levy for the support of the university units was increased to 3½ mills for the next ten-year period. An initiative measure authorizing an $850,000 bond issue for necessary buildings at Montana State college was defeated. Other collegiate institutions are Billings Polytechnic institute and Carroll college.

SAM C. FORD, governor of Montana, elected Nov. 5, 1940, on the Republican ticket

Charities and Correction.—The state supported institutions for orphans, tuberculars, blind, deaf, dumb and insane; also reform schools for boys and girls, and a state penitentiary. A 1940 legislative referendum carried, authorizing a $500,000 bond issue for improvements at the state hospital for the insane.

Finance.—The net bonded debt of the state was $9,261,282. The state income in 1940 was approximately $33,700,000. The net indebtedness of the 56 counties was $6,587,320 and their tax income was $9,340,000. City and town indebtedness was $4,557,646, and their tax income was $4,000,000. School districts with a net indebtedness of $8,511,000, had a tax income of $9,849,500 in 1939–40. The total tax delinquency in 1940 amounted to $15,508,321.

Agriculture, Manufactures, Mineral Production.—Montana farms and ranches (area 47,400,000 ac.) produced crops worth $61,483,000, in 1940. The leading crop was wheat, of which 60,811,000 bu. were raised. Other important crops produced were 2,465,000 tons of hay, 1,134,000 tons of sugar beets and 9,000,000 bu. of oats. The apple crop declined to 236,000 boxes. On the ranches are 1,107,000 cattle, 3,548,000 sheep, and 258,000 horses. Montana forests with an area of 14,613,000 ac. contain 50,000,000,000 bd.ft. of standing timber. Lumber production in 1940 amounted to 269,500,000 bd.ft. An abundance of electrical energy furnishes power for mills, factories and railroads. Metal production for 1940: copper, $28,611,600; gold, $9,649,500; silver, $8,787,200; zinc, $6,727,500; lead, $2,195,000—a total of $55,970,800 and an increase of 37% over 1939. Smelters for treating the ore are located at Anaconda and East Helena, and there is an important electrolytic refinery at Great Falls. Coal production amounted to 2,974,000 short tons and 6,768,000 bbl. of petroleum were produced, compared with 5,961,000 bbl. in 1939.

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Montreal, in the province of Quebec, Canada, is on an island at the confluence of the Ottawa and St. Lawrence rivers, approximately 1,000 mi. from the Atlantic ocean and 2,760 mi. from Liverpool. It is at the head of ocean navigation

and the terminus of lake vessels. It is served by three canal systems, the St. Lawrence canals, 1,230 mi. to the Great Lakes, the Eastern United States canals, via the Richelieu river and Lake Champlain, 127 mi., and the Ottawa river canals, 119 mi. The head offices of the Canadian Pacific railway and of the Canadian National railways are situated at Montreal.

Population of the city of Montreal (federal census, 1931), 810,925, and of greater Montreal, including its suburbs, 973,637. In 1940, as estimated by Lovell's *Directory,* the population was: city of Montreal 1,294,792, greater Montreal 1,476,737. Greater Montreal is governed by a metropolitan commission, the majority of whose members are appointed by the city council of Montreal.

For election purposes, the city is divided into 11 districts. Each district elects six councillors, of whom three are elected by proprietors only and the other three are elected by all electors of the district. This accounts for 66 members. The other 33 councillors are appointed by a number of public bodies.

The mayor is elected by the electors of the city at large. He is not a member of the executive committee. He is paid for his services as mayor.

The council appoints from among its members six councillors to act as an executive committee. The members of the executive committee are paid for their services.

The port of Montreal is the largest in Canada. War conditions have accelerated its activity, but the censor has requested that statistics should not be published.

For 1940 the amount of building permits issued stood at (new) 1,254, value $8,937,971; (repairs) 2,136, value $2,489,661; bank deposits (for 11 months ended Nov. 30, 1940) $7,892,470,189 and bank clearings (for 11 months ended Nov. 30, 1940) $4,751,565,739. The assessed value of real estate was $1,245,526,539.

(J. A. Ma.)

Montserrat: *see* West Indies, British.
Moravia: *see* Bohemia and Moravia.

Mormons. The church devoted much effort and considerable expenditure in perfecting and enlarging its welfare program, principally along three lines: It built at Welfare square (the home of the principal welfare storehouse) a modern, thoroughly equipped grain elevator with a capacity of 200,000 bushels. This was filling in 1940 with first grade flour wheat. The church, in addition, had a grain elevator in southern Idaho (capacity approximately 80,000 bushels), and a smaller elevator in mid-Utah with a capacity of 10,000 bushels—a total elevator capacity of nearly 300,000 bushels, sufficient to furnish bread for approximately 50,000 people. While the church furnished the storage, the National Woman's Relief society (a church women's charitable organization) supplied the wheat.

The General Welfare committee intensified its efforts in pushing forward its plans to make the welfare program produce all the materials used by it for distribution to the needy. To this end a church-wide survey was made of assistance needed. Based on scientific studies of the church and the government, an estimate was made of the amount of food, clothing, fuel, shelter required to supply the needs. This total amount was divided among the several component administrative units of the church—stakes (and by them divided among their respective sub-units—wards), each unit, large and small, being assigned its quota of designated articles. In 1940 the program produced more than 50% of all it distributed. The total help extended for 1941 will be approximately 75% program-produced. In 1939 the church extended assistance to more than 50,000 worthy church members.

The church extended its efforts to the building up of its Deseret industries—the equivalent of the Goodwill industries of ot organizations—by which it takes old clothing, shoes, furnitu toys, clocks, musical instruments, etc., and rebuilds them sale to the public. The General Welfare committee added a partment which buys new cloth, cuts it for women's and c dren's clothing of various kinds, then sends it to various W Woman's Relief society organizations, who do the sewing voluntary free service. This was supplied then to the various tributing agencies for the original cost of the cloth. (J. R. Cl.)

Morocco: *see* French Colonial Empire; Spanish Colon Empire.

Morrow, Honoré (Willsie) (1880–1940), U.S. auth was born in Ottumwa, I the daughter of William Dunbar McCue. She was gradua from the University of Wisconsin, and then went to Arizo While there she wrote her first book, *The Heart of the Dese* After two years in the west she went to New York city and w editor of *The Delineator* for five years from 1914. Among many novels were three dealing with the life of Lincoln. S also wrote biographies of A. Bronson Alcott, Mary Todd Linc and John B. Gough. She was twice married. Her second husba was William Morrow, a publisher. On his death in 1931 she ma her home in Brixham, England. She died in New Haven, Con April 12.

Motion Pictures. The motion picture industry, born Thomas Edison's invention, entered 52nd year in 1941 generally committed in the United States to policy of fewer and better pictures, with accent on Americ themes. Cumulative effects of the wars abroad were the great influence bearing upon the industry in 1940. Continued shrinka of foreign markets caused increasing attention to the domes market. Industry leaders expected that defence spending wou have a stimulative box-office effect in 1941. Though a diffic year economically, 1940 witnessed the production of a surprisin large number of significant and outstanding pictures.

Estimated capital investment in the motion picture indust in the United States (statistics of Motion Picture Producers a Distributors, Inc.):

Theatres	$1,900,000,000
Studios	125,000,000
Distribution	25,000,000
	$2,050,000,000

Because of uncertainty caused by war, there was practica no building or other capital investments in 1940.

Gross returns in all United States theatres during the year w estimated at $1,000,000,000, of which $100,000,000 went to t federal government and $250,000,000 to state and local gover ments for taxes. An estimated 287,500 persons were given e ployment in exhibition, production and distribution, the yea payroll being placed at approximately $370,060,000.

In general, industry statistics must be considered as appro mations. The system of film rentals is extremely complicate Employment swings in wide arcs. Despite all attempts at produ tion standardization, pictures cannot be rolled out on an asse bly line as can automobiles. However, even in the face of risi labour costs, the studios seem to be making some headway towa economy, without reflecting upon quality. This means elimin tion of "dead wood" left over from the old lush days, increas concentration on technical improvements, efficiency and m careful planning.

Estimates on the weekly attendance at U.S. motion pictu theatres ranged from 50,000,000 to 85,000,000. The industry w seeking to enlist the interest of those millions of America

Above, left: KATHARINE HEPBURN and James Stewart in *The Philadelphia Story*. Stewart won the 1940 Academy award as the best actor of the year for his part in this picture

Above, right: JOAN FONTAINE (right) as Mrs. de Winter and Judith Anderson as Mrs. Danvers in *Rebecca*, voted the best motion picture of 1940 by the Academy of Motion Picture Arts and Sciences

Right: AKIM TAMIROFF and Brian Donlevy as the fighting friends in *The Great McGinty*, which, judged the best original screen play of 1940, was given the Academy award

Below, left: WALTER BRENNAN, for his role of Judge Bean in *The Westerner*, was named the best supporting actor of 1940 by the Academy of Motion Picture Arts and Sciences

Below, right: HENRY FONDA as Tom Joad and Jane Darwell as his mother in *The Grapes of Wrath*. Jane Darwell won the 1940 Academy award as the year's outstanding supporting actress for her work in this picture

Lower left: FOR HER TITLE ROLE in *Kitty Foyle*, Ginger Rogers received the 1940 award of the Academy of Motion Picture Arts and Sciences as the outstanding actress of the year

Lower right: CHARLES CHAPLIN in *The Great Dictator*

who, though financially able, seldom see pictures.

Chinese and Japanese markets remained lost to American films. With the German invasion of the Low Countries and the reduction of France to a state of vassalage, continental Europe was practically closed to American pictures in 1940. Even in the few small countries still taking American products, currency restrictions made the market of negligible importance. The British empire, the best foreign market for American films, also was compelled to adopt currency restrictions to husband its resources in the battle for existence. However, the close of the year saw arrangements made for an estimated release of $12,500,000 in English proceeds to American companies.

Latin-America became the best possibility for market development. From a financial standpoint, there has been a tendency to over-rate its importance, as the region's per capita income is not high. However, Latin-America has become a political as well as an economic battleground for American films. Partly by their nature, partly through circumstances, they are playing an important role in the campaign for Pan-American solidarity. Regarded as the spearhead of democratic influence, American pictures were being bitterly opposed by the axis powers. Latin-America was being flooded with totalitarian films, even to the point, according to report, of free distribution. As the year ended, it was uncertain as to whether Charles Chaplin's *The Great Dictator,* burlesquing Hitler and Mussolini and pleading for world peace and tolerance, could be shown in a number of Latin-American countries. Among these were Brazil and the Argentine, the two greatest South American powers, where the influence of German and Italian minorities was especially strong. Axis diplomats accredited to Latin-American countries were said to be using their official influence to ban American pictures regarded as unfavourable to totalitarian doctrines. Economic pressure was applied, and, as the nations of Latin-America were at peace, their position was more or less delicate. In addition to *The Great Dictator,* such pictures as *Confessions of a Nazi Spy, The Mortal Storm* and *The Man I Married* were foci for political conflict. Showing of such pictures in Latin-American countries was frequently the signal for rioting, especially in Mexico, assertedly due to subversive influences.

During 1940 a cycle of pictures with Latin-American themes started in Hollywood. The future is expected to see this trend increase. The first films were of a musical nature, with Rio de Janeiro and Buenos Aires supplanting fallen Paris as symbols of glamorous living. As part of the U.S. government's program, John Hay Whitney was working with the studios toward the production of pictures designed to strengthen Pan-American amity.

As the concern of Americans over affairs abroad steadily increased, this was reflected in the motion picture industry. European producers had long envied the American industry's freedom from government control and interference. American pictures have to please the people, not the government.

In the matter of preparedness and defence, the industry's cooperation was given freely and enthusiastically. The industry knew that its existence depended upon the survival of democracy. Its freedom of expression was in 1940 limited only by concern for public opinion. As constituted, it could not exist under a totalitarian regime.

Because of the industry's financial structure, American pictures must necessarily have wide box-office appeal. It is significant that pictures of wide appeal have come only from democratic countries. Until the war limited production, England was producing pictures that ranked with America's best, and France was taking great strides forward.

The dawn of 1941 found practically every Hollywood studio considering pictures with conscription as a theme. Studios w active, especially in the short subjects field, in the product of films stimulating interest in the nation's armed services. H lywood was being self-surveyed with a view to best contributi its technical skill to the national defence.

As a period of widespread distress, 1940 was a year of giv in Hollywood. Under the leadership of Louis B. Mayer, $464,c was raised for the Community Chest, and, under Samuel Go wyn, $440,000 was contributed to the Red Cross.

After considerable bewilderment, the industry learned in 19 that a large section of the American people apparently wa their entertainment distinct and separate from their informati

Periods of dramatic intensity in the war, such as the invasi of the Low Countries, found many people at home listening radio broadcasts, with the theatres suffering a resultant drop revenue. Theatre owners, misled by the popularity of radio w news, were surprised to find their patrons objecting to war su jects as the theme of feature films. As anti-totalitarian sen ment in the United States mounted, interest in anti-totalitari features seemingly decreased. More and more the American pe ple were coming to regard the theatre as "a place for enterta ment." This tendency to distinguish between entertainment a information was reflected in the rise of theatres devoted sol to newsreels and short subjects. Censorship in the warring cou tries, however, made it practically impossible for Americ newsreel units to obtain their own material. Releases put out the belligerent governments constituted most of the war mater reaching the American screen. The year found American new reel companies withdrawing units from the war areas, and s tioning them in South America.

More outstanding pictures than in any previous year dist guished 1940. Among them were *Rebecca, Foreign Correspon ent, Dr. Ehrlich's Magic Bullet, The Great Dictator, Boom Tow Northwest Mounted Police, Fantasia, The Sea Hawk, Tin P Alley, Grapes of Wrath, The Philadelphia Story, Knute Rockne All-American, Arise, My Love, The Great McGinty, The Lett The Long Voyage Home, Our Town, The Mortal Storm, T Thief of Bagdad* and *Kitty Foyle.*

The *Motion Picture Herald* reported that its 1940 exhibit poll on the ten top box-office stars found youthful Mick Rooney again in first place. He was followed by Spencer Trac Clark Gable, Gene Autry, Tyrone Power, James Cagney, Bi Crosby, Wallace Beery, Bette Davis and Judy Garland.

The New York film critics' award for the year's best pictu went to Twentieth Century-Fox's *Grapes of Wrath,* from Jo Steinbeck's controversial novel dealing with "refugees" from t midwestern drought areas. The best direction award went John Ford for *Grapes of Wrath* and *The Long Voyage Hom* The preceding year Ford was similarly honoured, for *Stagecoa* Award for best actor performance went to Charles Chaplin *The Great Dictator,* the best actress performance to Kathari Hepburn in *The Philadelphia Story.*

A special award was voted to Walt Disney, Leopold Stokow and their associates for *Fantasia.* From an artistic standpoi this was undoubtedly the year's most significant picture. Hail by critics as the creation of a new art form, it immediately came the subject of violent controversy, especially in musi circles. *Fantasia* is a concert illustrated by animated drawin in Technicolor. In it Disney gives his interpretations of sel tions from Beethoven, Bach, Schubert, Stravinsky and oth (played by the Philadelphia symphony orchestra, Stokowski co ducting) in visual effects ranging from dances of flowers to t life of prehistoric monsters. For some time to come, *Fantasia* w be limited in its exhibition by the necessity for special sound a paratus. This special equipment, christened "Fantasound," w

eloped by Disney technicians and Radio Corporation of erica engineers.

uring 1940, *Gone With the Wind,* released late in 1939, estab-ed itself as the top grossing picture of all time. Showing at advanced prices, with its general release to come in 1941, gross was estimated at $18,000,000, with an ultimate of $25,-000 expected. Its cost was placed at about $4,000,000.

ther pictures of the year with grosses estimated in the mil-s were *Northwest Mounted Police, Boom Town, Foreign Cor-ondent, Andy Hardy Meets a Debutante, Rebecca, The Great tator, The Philadelphia Story* and *Kitty Foyle. The Great Dic-r* was expected to gross $3,500,000 in the United States and ada, a sum exceeded by other outstanding Chaplin pictures n the world markets were still free. Despite war conditions, it v large audiences in England as did *Gone With the Wind, thwest Mounted Police,* and surprisingly, *Knute Rockne—All-erican,* based on American football. Grosses in the millions e, of course, rarities. In general, the studios, through trimming eduction costs, hoped to realize profits on smaller grosses.

Iollywood made 584 feature pictures during the year; 530 in 9.

ecause of the war, few important foreign pictures were shown he United States in 1940. Outstanding were: English—*Pastor l,* anti-nazi film with a foreword by Mrs. Franklin D. Roose-; French—*The Baker's Wife* and *Hotel du Nord,* with Anna-a. The New York critics voted *The Baker's Wife* the best ign picture of the year.

he war brought some of Europe's best talent to Hollywood: red Hitchcock, whose *Foreign Correspondent, They Knew at They Wanted* and *Rebecca* placed him as one of the year's standing directors; Alexander Korda, whose $2,000,000 *Thief Bagdad* was begun in England and finished, because of war, in United States; René Clair, famous French director, under con-t to Universal; and Erich Pommer, former UFA producer.

he trend in American pictures in 1940 was away from propa-da motifs and biographical pictures, the latter receding from r 1939 popularity. Pictures dealing with the American scene, ecially the so-called glorified "western" or action picture, such *Northwest Mounted Police,* and musicals came increasingly their own.

uring the year, Hollywood's economy efforts were aided by uctions in raw film prices and in the price of Technicolor re-e prints. The studios showed an increased interest in Techni-r. Among the outstanding Technicolor pictures were *Fantasia, Thief of Bagdad* and *Northwest Mounted Police.*

Consent Decree.—The government's anti-monopoly action inst the industry resulted in the so-called "consent decree," curred in by most of the larger companies. This calls for the lition of "block booking" and "blind selling," under which ex-tors contracted, in advance, for a studio's entire yearly pro-tion. The decree provides that pictures shall be sold only in ximum blocks of five, and only after they have been seen by ibitors at regional showings. Hollywood believed this would ult in fewer and better pictures, thus contributing to the ntual elimination of the double feature bill. Agitation by lers of the industry against double features reached a peak in o. In August Dr. George Gallup, director of the American In-ute of Public Opinion, reported that a nation-wide poll showed % against double feature bills. The dual bill, it was found, was st popular with children and persons in the low income ckets. It was believed that this condition, coupled with the ns of selling under the consent decree, would militate strongly inst production of "B" or second-grade pictures.

abour.—Labour conditions in general were peaceful compared 939. It was estimated that further reductions in the amount of labour employed took place during the year. Decrease in the amount of work given "extra" players was noteworthy.

ONE OF THE MOST PUBLICIZED MOTION PICTURES of 1940 was the German *Feuertaufe (Baptism of Fire),* a pictorial summary of the Polish campaign which had its première April 6, on the eve of the Norwegian invasion. Part of the picture was incorporated into the American-produced *The Ramparts We Watch*

Censorship.—Under the direction of Will H. Hays, for 17 years head of the Motion Picture Producers and Distributors of America, Inc., the principal producers continued under a voluntary censorship. The most serious criticism of this idealistic scheme was that it sometimes sacrifices artistic integrity to considerations of security at the box office—but always in the name of public morality.

Awards.—*Gone With the Wind* swept the 1939 awards of the Academy of Motion Picture Arts and Sciences (announced in Feb. 1940) as no other picture had ever done. It was voted the best picture of the year, and to its producer, David O. Selznick, went the Irving Thalberg Memorial award "for most consistent high quality achievement by an individual producer."

Other *Gone With the Wind* awards were: best actress, Vivien Leigh, the English actress, for her role of Scarlett O'Hara; best supporting actress, Hattie McDaniels, Negro actress; best direction, Victor Fleming; best colour cinematography, Ernest Haller, Ray Rennahan; best screen play, the late Sidney Howard; best art direction, Lyle Wheeler; best film editing, Hal Kern (supervisor), James Newcom. In addition, a special award went to William Cameron Menzies for outstanding achievement in the use of colour for the enhancement of dramatic mood in the production of *Gone With the Wind.*

Other awards of the academy were: best actor, Robert Donat, the English actor, in *Goodbye, Mr. Chips;* best supporting actor, Thomas Mitchell, in *Stagecoach;* best black-and-white cinematography, Gregg Toland, *Wuthering Heights;* best original film story, Lewis R. Foster, *Mr. Smith Goes to Washington;* best sound recording, Bernard B. Brown, *When Tomorrow Comes;* best original score, Herbert Stothart, *The Wizard of Oz;* best scoring, Richard Hageman, Frank Harling, John Leipold, Leo Shuken, *Stagecoach;* best song for picture, E. Y. Harburg and Harold Arlen for "Over the Rainbow," from *The Wizard of Oz;* best special effects, Edmund H. Hansen, *The Rains Came.* Judy Garland was voted a special award "for her outstanding performance as a screen juvenile" in 1939. In the short subjects field, the award for the best cartoon went to Walt Disney's *The Ugly Duckling;* 1,000 feet or less—Paramount's *Busy Little Bears;* 1,000 to 3,000 feet—Warner Brothers' *Sons of Liberty.*

During 1940 two pioneer stars, outstanding in their time and known to millions of fans all over the world, Tom Mix and Marguerite Clark, died. (L. O. P.)

Technical Developments.—The year 1940 saw the first wide-

spread use of photographic objectives and projection lenses which were treated with anti-reflection coatings. The evaporation method of depositing thin films on glass surfaces was perfected to the point where reliable and consistent reduction of reflection at glass-to-air surfaces could be secured on the various lens types commercially employed. The contrast of the image produced by coating the lenses is greater than that produced by untreated lenses, due to the elimination of multiple reflections between the several lens elements.

This improvement has been found of particular value in theatre projectors, since it is extremely difficult to secure sufficiently high values of screen illumination even when the projectors are equipped with high intensity arc systems. Likewise, studios' special effects photography departments find the treated lenses of great value in securing the necessary illumination levels on process projection screens.

Built-in electro-optical slating mechanisms (for film identification purposes), providing for a complete photographic record of each scene while the cameras are coming up to normal operating speed, were introduced during 1940 at Twentieth Century-Fox and Paramount studios.

An arbitrary system of lens calibration was established at the Twentieth Century-Fox studios. Its camera department successfully recalibrated all of the lenses employed by that studio for photographic purposes by photoelectrically recalibrating all lenses against a single selected standard objective. The standard "F" system of stop-markings has been retained, but the diaphragm markings have been so re-engraved that all of the lenses employed by that studio will give identical negative exposures when employed at identical stop settings.

During 1940 the National Carbon company made available to the various studio special effects photographic departments a new type of carbon for projector arc lamps, the structure and composition of the new carbon being such that approximately 20% greater light output is secured from the arc for a given value of arc current than was formerly obtained.

Realism in battle scenes, involving the use of machine guns, has often been obtained by firing blank cartridges in the guns. Warner Bros. studio has developed equipment which permits firing, at any predetermined rate, charges of acetylene gas mixed with air. The sound of firing and the spurts of flame at the gun muzzle closely simulate these features of a gun operated in the normal manner. By this method, the guns are rendered completely harmless to members of the cast.

A difficult production problem was overcome at Warner Bros. studio during the year 1940 by the construction of a special large stage to house ships employed in the production of feature pictures, such as *The Sea Hawk* and *The Sea Wolf*.

The ships photographed in *The Sea Hawk* were full-scale models, the larger one weighing approximately 292½ tons, and the smaller one weighing 116½ tons. The larger ship was supported by a series of hydraulic jacks, so constructed and interconnected as to permit giving pitching and rolling motions to the vessels, which accurately simulated any motion which the ship would normally experience at sea. The master control unit installed in the hydraulic system permitted complete control of the motion of the larger ship and the synchronization of these motions, when necessary, with those of the smaller vessel. The smaller vessel was also mounted on hydraulically operated jacks. The small ship and its supporting jacks were mounted on a car, by means of which the ship could be moved across the stage. The entire system was designed to operate under water, since the stage floor had to be flooded for the sea scenes.

Proper appearance of the surface of the sea on background screens was obtained through the development and construction of a novel type of ripple machine. These machines consisted of three heavy cellophane screens suspended vertically behind muslin drop curtains employed for painted backgrounds, each cellophane screen bearing a series of opaque stencilled wave patterns. Suitable differential, vertical, oscillatory motion was imparted to the three screens through a system of shafts and cams, so that when the ripple screens were illuminated from behind, a continuously varying ripple pattern was projected on the background drop curtain. The degree of perfection of the illusion created by this device can only be fully appreciated when it is actually seen in operation.

The mechanical department of Warner Bros. studios also developed a new type of fog machine capable of generating a fog of sufficient density to remain near the floor of the enclosure in which it is used. The new type of fog machine passes atomized oil over layers of dry ice before it passes into the set from the generating unit. The chilling of the vapours results in a sufficient increase in density to cause the atomized particles to remain suspended near the floor of the set for a considerable period of time.

While the past years have been credited with the technical developments of such items as the silent treadmill by Paramount studios, the triple head projectors by Warner Bros. and Paramount studios and the new Mitchell silent and superportable transparency projectors, the technique of using all of these in combination reached its high point during 1940, as indicated by the increased use of background projection photography by reason of these developments, with greatly enlarged screens and colour backgrounds at Warner Bros. and Paramount studios.

Films.—While no outstanding new developments in the manufacture of film came to light during the year 1940, the Eastman Kodak company did announce a new film lacquer, which may be employed as a protective coating over the film emulsion. This lacquer provides a surface of sufficient gloss to practically eliminate the mottling effect caused by oil on the emulsion surface. The lacquer may be completely removed from the emulsion surface whenever desired by bathing the film in a weak sodium carbonate solution and reapplying if desirable. Two types of lacquer are available for either wick or bead (roller) application.

Colour Photography.—A large amount of development work was carried on during the year 1940 by Technicolor corporation, with a view to using single film cameras in the production of three-colour motion pictures.

SCENE from the "Nutcracker Suite" sequence of *Fantasia*, a unique full-length production of 1940 in which Walt Disney's animated drawings are accompanied by "dimensional" music conducted by Leopold Stokowski

The Dunningcolor corporation, of Hollywood, Calif., announced that its subtractive method of making three-colour motion picture prints by photographic means was commercially available for the production of prints directly from any standard three-colour separated negatives onto a double emulsion coated projection positive.

Motion Picture Lighting.—Development work in this field, particularly with reference to fluorescent lighting, went steadily forward with continued minor improvements.

Sound.—The year witnessed the first public demonstrations of stereophonic recording and reproduction of speech and music from film sound track. This form of recording and reproduction of sound attempts, through the use of multiple recording and reproducing equipments, to so re-create the recorded sound that the listener is conscious of the spatial distribution of the original sources of the sound. The equipment employed for these demonstrations was developed by the Bell Telephone laboratories and demonstrated to the motion picture industry in New York city and in Hollywood by Electrical Research Products Inc. This equipment is capable of reproducing a range of sound intensities equivalent to that of a full orchestra without perceptible distortion or masking of the weakest sounds due to film background noise.

RCA Manufacturing Company, Inc., together with Walt Disney, developed its system called "Fantasound" and employed it first in the production and exhibition of the Walt Disney feature-length production *Fantasia*. This system, in order to obtain a stereophonic effect in the reproduction of sound-on-film, and to carry a spatial distribution of the reproduced sound, as represented on the pictorial screen, uses a separate film with three sound tracks and a control track in addition to the film which carries the picture. The control track of the auxiliary film employs three carrier frequencies (one for each of the three sound tracks on the films). The material reproduced from each of the three sound tracks is separately amplified and fed to the individual loud speakers, which may be located at any part of the theatre from where it is desired to direct the sound.

The control track method of securing a simpler though very effective dramatic aid in the reproduction of sound motion pictures, which differs from the two stereophonic systems mentioned above, was developed by the Photophone Division of RCA Manufacturing company and demonstrated to the public as "Vitasound" by Warner Bros. Pictures, Inc., with the showing of *Four Mothers* at the Hollywood theatre, in Hollywood, Calif., on Dec. 17, 1940, and with the showing of *Santa Fe Trail* at the Strand theatre, New York, about the same time.

This equipment utilizes a control track printed on one side of the film in the sprocket hole area to control the amplification of the theatre reproducing system and the number of speaker systems in operation at any given instant of time. Music and dialogue in all normal scenes of a motion picture are reproduced with the normal amplification, and those scenes and musical passages, whose dramatic value is enhanced by higher levels of reproduction, receive, through the automatic action of the control track, greater than normal amplification, and are so reproduced through the normal speaker system and the auxiliary loud speakers located on either or both sides of the normal speaker system.

The addition of auxiliary loud speakers causes a broadening of the source of sound in the theatre, and from a dramatic standpoint is much more effective than any increase in loudness from the normal speaker system.

This RCA control track system is (1940) in process of standardization by the research council of the Academy of Motion Picture Arts and Sciences and allows for many variations, at minimum cost, as it may be operated so that only the main or centre set of speakers behind the screen alone is operating, or the auxiliary speakers alone may be operated, or any combination of the main and auxiliary speakers may be automatically operated. The over-all system amplification may be increased or reduced automatically by predetermined printing of the control track.

During the year 1940, the Metro-Goldwyn-Mayer sound department introduced the employment of mercury-vapour type exciting lamps in the recording machines employed for recording release negatives. The temperature at which these lamps operate satisfactorily is rather critical, and the following novel method of temperature control has been employed with great success:

The glass tube surrounding the mercury vapour capillary tube is open both ends so that a stream of cooling air can be passed over the capillary. ıe series-wound blower motor is electrically connected across the ternals of the mercury vapour lamp. As the temperature of the lamp rises, e voltage drop across the lamp increases and causes the blower motor operate at increased speed, thereby increasing the rate of lamp cooling. ɔnversely, when the lamp temperature drops, the voltage drop across e lamp decreases, causing reduced blower speed and a lower rate of ɔling.

The discovery of a type of selective frequency distortion in recording annels employing electronic volume compressors resulted in a basic ɔdification of the compressor control circuits by the sound department Warner Bros. studios. The operation of the modified electronic comessors is such as to remove all of the excessive sibilants previously prest in circuits employing compressors to restrict the volume range of cordings.

Projection.—A new light source which is supplied with power by a power it radically different from those conventional types which have been in use : many years made its appearance during the year 1940. Particularly apted to medium and small theatres where moderate size screens are ed this new light source is capable of projecting pictures of unusual ırity and colour definition at a surprisingly low operating cost.

One of the outstanding features of the new projection system is the wer conversion equipment, which instead of converting the current from ernating to direct, merely changes it from alternating current of one quency to alternating current of a higher frequency. This light source ıs a development of Clarence S. Ashcraft and is referred to as "Cyclex." *ee* also PHOTOGRAPHY.) (N. LN.)

oton, Robert Russa (1867–1940), U.S. Negro educator, was born Aug. 26 of parents who d been slaves in Amelia county, Virginia. He was educated at ampton institute and on graduation was persuaded to remain as eacher. He taught at Hampton for 26 years, and in 1915 he was ected as the successor of Booker T. Washington as principal of ıskegee institute. He retired in 1935 because of ill health and ıs made president emeritus. Active in promoting the welfare of S. Negroes, he was honoured by several colleges which gave him norary degrees. He was the author of several books, including autobiography, *Finding a Way Out* (1920). He died in Capasic, Va., May 31.

otor-Boat Racing. By the end of the U.S. season 27 new marks had been set in the various board classes and 17 in the outboard-powered division.

Although breakdowns prevented her capturing more than one of e three major trophies for which she competed, the new Gold p hydroplane "Notre Dame" was the year's outstanding boat. ıe was designed and driven by young Daniel Arena for Herbert endelson of Detroit. In both the 90-mile Gold cup contest at orthport, Long Island, and at the Red Bank, N.J. National veepstakes championship, "Notre Dame" managed to finish in ly one heat. In the latter contest, however, she set new standds for lap and heat of 76·923 and 76·140 m.p.h. respectively, e best competitive time ever made by a Gold cup boat. "Notre ame" later won the President's cup at Washington at a comratively leisurely pace and then brought her activities to a fitting max by setting a new international 12-litre mark for one mile of o·987 m.p.h.

Victory in the famous Gold cup classic went to Sidney Allen's Iotsy Totsy III" representing the Montauk Yacht club when all e newer, faster boats suffered breakdowns.

The 225 cu.in. hydroplanes were again pre-eminent in the inard racing field with the principal honours divided. When his Tops III" was at her best the veteran Jack Cooper was virtually beatable and he took the greatest number of first places in imrtant events, as well as setting new world speed marks. Thomas atfield's "Viper III," however, took the honours for consistency d David Foreman, driving Chauncey Hamlin's "Voodoo," set a w one-mile standard of 88·786 m.p.h.

(H. L. ST.)

otor Buses: *see* MOTOR TRANSPORTATION; MOTOR VEHICLES.
otor Cars: *see* MOTOR VEHICLES.
otor Racing: *see* AUTOMOBILE RACING.

Motor Transportation. Commercial highway transport is America's fastest growing form of public transportation. This applies equally to motor bus passenger operation, and to motor truck freight operation, each of which represents a separate industry in itself.

Buses.—In the motor bus field two main operating groups are involved. These are companies offering intercity or long-haul service, and those engaged in purely local service within the limits of a single city and its adjoining suburban areas. Intercity carriers, in turn, group roughly into companies operating within the boundaries of one state, known as intrastate carriers, and those crossing state boundaries, known as interstate carriers.

All types of motor bus companies are closely regulated, either by state, federal or municipal agencies, and in some cases by all three. Interstate highway carriers have been under federal regulation since 1935. The Motor Carrier bureau charged with this regulatory responsibility is a division of the Interstate Commerce commission and governs both motor bus and motor truck operation that is of an interstate character. Intrastate carriers, those operating solely within the boundaries of a state, have long been under the regulation of their respective state governments. In both types of regulations the fundamental provisions are similar and, in general, consist of rules governing insurance requirements, measures designed to promote safety on the highways, a standard accounting classification, the filing of tariffs and compliance with the rates filed in those tariffs. City or local carriers usually are regulated in a somewhat similar manner by the governing bodies of the cities or municipalities in which they operate.

The motor bus industry represents an investment of more than $1,000,000,000, including $646,600,000 for rolling stock and $238,000,000 for terminals, garages and maintenance equipment. Annual taxes directly assignable to operation total close to $44,219,000 annually, not including state and federal income taxes and excess profit taxes. The actual size of the industry is indicated by the following figures from the latest census.

At the close of 1940 there were 3,478 bus operating companies in the United States. Of these, 750 companies were operating in city service, 2,308 in intercity and long-haul service and 420 in sightseeing and charter hire services. These companies jointly owned 54,000 buses, divided 33,550 in city and suburban service, 18,000 in intercity and long-haul service and 2,450 in sightseeing and other types of common carrier service. Jointly they operated over 343,300 mi. of highway, of which 28,300 mi. was in city service and 315,000 mi. in intercity and long-haul service.

Motor bus revenue for 1940 amounted to $436,196,000, divided $255,649,000 for city carriers, $172,047,000 for intercity carriers and $8,500,000 for sightseeing and miscellaneous operation. Passengers carried by buses in 1940 reached the astounding total of 3,986,837,000. Of these, 3,633,248,000 were city passengers, 350,089,000 were intercity passengers, including sightseeing and charter hire.

One of the most interesting trends was the gradual change-over from railway to bus operation in cities. The records show that over 600 cities in the United States, having a population of more than 10,000, were served in 1940 entirely by buses. (There are less than 1,100 cities in this population group.) The electric railways and their subsidiaries had approximately 19,250 buses. The steam railroads also went in heavily for motor bus operation. Fifty-two railroads owned 1,775 buses, while in addition, many steam railroad companies held substantial stock ownership in motor bus operating companies and thus were directly interested in motor bus transportation.

Still another phase of motor bus operation is represented by the school bus field. While school bus operation is not a source

of large revenue—since much of the equipment is school-owned and the balance operated under relatively low-priced contracts—it does represent a highly important phase of the nation's educational system. Approximately 44,250 schools used buses in 1940 to carry pupils to and from their classes, utilizing a total of 87,300 buses. In the neighbourhood of 3,750,000 children were carried daily in this service, at an annual cost to the schools of $76,053,000. There were approximately 1,270,000 mi. of school bus route.

Trucks.—In size the motor truck field far exceeds the bus field, and there are many ramifications as to the types of service operated. Trucks are used not only by cartage companies in cities and by long distance haulers, but by private businesses as a part of their service to customers. The latest census by the Automobile Manufacturers' association shows, for instance, that in 1939 there were 997,033 trucks on farms alone. Registrations for 1939 showed that 4,320,829 trucks of all types were licensed during that year. For 1940 the estimated registration was 4,650,000.

The large truck fleets are owned mostly by private shippers. On June 1, 1939 the Bell Telephone company, for instance, operated 16,210 trucks; Standard Oil of New Jersey, 12,000; the Railway Express agency, 9,960. According to compilations of the Automobile Manufacturers' association 31 private companies operate more than 1,000 trucks apiece, while approximately 1,000 companies operate truck fleets ranging all the way from 100 to 1,000 trucks apiece. These figures do not include tractors, trailers or cars owned by these companies. In 1939 there were 1,180,411 trailers registered in the U.S.

Railroad use of motor trucks is rapidly expanding. In 1925 a total of only 900 trucks were used in railroad service. By the end of 1939 this had grown to approximately 65,500 trucks in railroad use. This includes terminal transfer service, intercity service, and store-door delivery. Another 230,375 motor trucks are owned by federal, state and local governmental departments. A highly significant sidelight on the use of motor trucks was offered by a study of the U.S. bureau of public roads which in May 1939 reported that 80% of all trips by motor truck are under 20 mi. in length. According to another government survey 60% of all common carrier truckers travel less than 100 mi. per trip.

The trucking industry gave employment to more than 3,650,000 drivers in 1940, with an uncounted number of freight handlers, mechanics, and helpers. It is closely regulated in every state as to sizes, weights, speeds, and must conform with innumerable other regulations both state and federal. It pays annually over $400,000,000 in special truck taxes over and above all regular levies on business, property and income. In 1940 it served 48,000 communities not reached by the railroads. (C. W. S.)

UNDERFLOOR POWER and underseat baggage compartments are features of this new 29-passenger motor coach

Table I.—*Distribution of Motor Truck Fleets by Industries*
(Source: Chilton Company)

As of February, 1941	Fleets of 8 or More Trucks	
	Fleets Number	Trucks Number
Bakeries, Candies, Florists	1,485	62,342
Bottlers, Breweries	930	24,046
Coal Dealers, Mineral Mines	1,041	18,297
Contractors, Builders	2,457	50,775
Dairy Products, Milk, Ice Cream	1,485	62,553
Department Stores, Furniture	417	11,020
Express, Hauling, Inter & Intra State	5,301	176,313
Flour, Feed, Grains	140	5,433
Government, State, County, Municipal	2,060	239,902
Ice Dealers, Manufacturers	575	15,011
Laundries, Cleaners, Dyers	1,556	34,766
Manufacturers, Steel Mills	837	15,624
Meats, Fish	670	17,489
Newspapers, Publishers	137	4,088
Oil, Gasoline, Greases	1,224	75,045
Paints, Chemicals, Drugs	170	3,723
Public Utilities, Railroads	1,210	79,545
Vegetables, Farmers, Chain Stores	1,517	39,769
Miscellaneous	1,059	23,851
Totals	24,271	958,492

These fleets operate, in addition, over 500,000 passenger cars.

Other Countries.—No figures of the motor cars registered in most the principal countries at the close of 1939 being available, the figures f the beginning of that year are given in Table II.

Table II.—*Motor Vehicle Registrations, Exclusive of U.S., in 1938*

Country	Private Cars Taxis '000's	Trucks Buses '000's	Total '000's
United Kingdom	1,916	626	2,542
France	1,750	500	2,250
Germany	1,306	402	1,708
Canada	1,161	220	1,381
Australia	552	252	804
U.S.S.R.	85	593	678
Italy	303	86	389
Union of South Africa	294	45	339

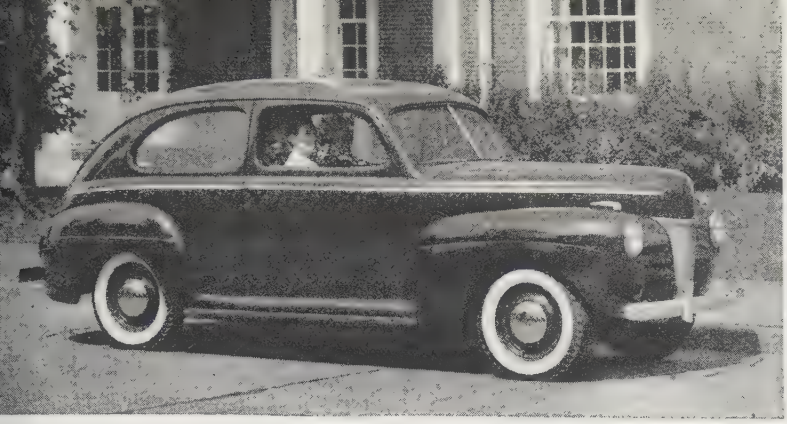
Even if figures were available, they would be very misleading. The ye 1940 opened with motor transportation reduced, except for military pu poses in all countries actively engaged in war. The spreading of the w and the effectiveness of the British blockade resulted in an extension the reduction, until it can be said that no European country was u affected. The extent of the reduction was variable in quantity, but the fa was rarely less than 50% and more often greater, as the vehicles still operation were running a smaller mileage in a year. Many countries ou side Europe were affected, so in the old world a reduction was universa Nor had the increase in military transport made good the reduction the private and commercial fields. The diversity of the traffic general on the roads declined.

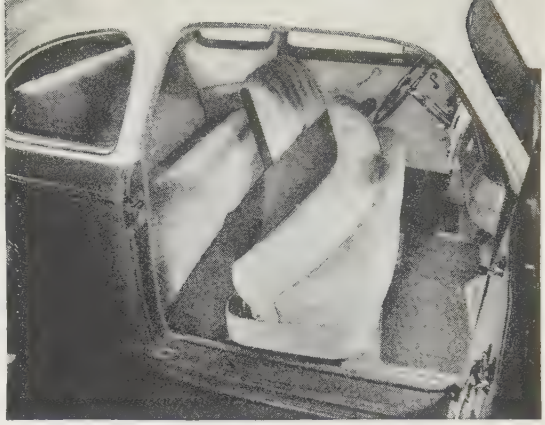
The standard of public service on the roads was changed. The servic were fewer and ran with less frequency; there was a much closer adjustme of service to the actual traffic. While this meant fewer vacant seats and le unutilized space, it also meant more overcrowding and more overloadin Fares and rates rose following a rise in costs. All this had an effect the division of traffic between rail and road. The division though was n on merits, but mainly determined by circumstances of place and time, a governmental control; so it was doubtful whether the experience would much towards solving the problem of the division of function in pea time. It was, however, made clear that no country can afford to let railways decay as the result of road competition. It also demonstrated t great advantage of having alternative means of transport, as even in w both are unlikely to be put out of commission at the same time.

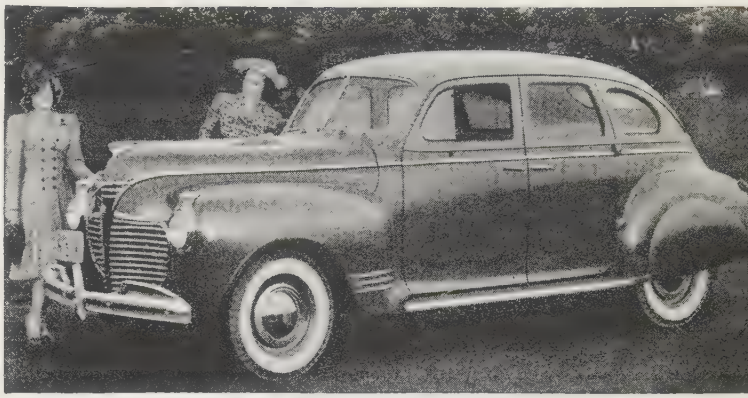
The problem of safety on the road still confronted the world unsolve In spite of the large reduction in the use of the roads, such figures were available indicated that the deaths and injuries from accidents h fallen little from the level of the pre-war months of 1939. In countri actually at war there were special reasons for this. The restrictions lighting on account of either attacks by air or the fear of them were doubt a predominant cause, but many persons were driving on the ro not fully qualified because of the relaxation or abandonment of tests drivers. (*See* also RAILROADS.) (W. T. ST.)

Motor Trucks: *see* MOTOR TRANSPORTATION; MOTOR VEHICLES.

Motor Vehicles. The 1941 models in the U.S. were form ly announced to the public at the au mobile shows in Oct. 1940. The effect of the preparedness pr gram did not affect the 1941 models because most of the tooli and manufacturing setup was completed before the defence wo started. During the latter part of 1940 the national defence wo was under way and all of the automobile producers were work on government orders. Various companies were building plants a







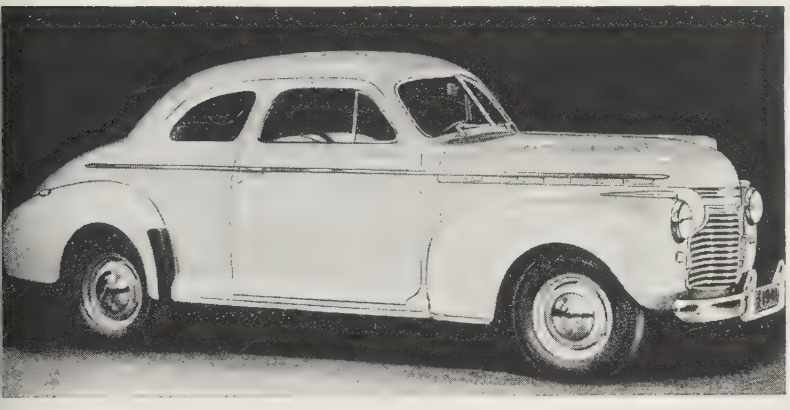
bove, left: 1941 FORD De Luxe Tudor sedan

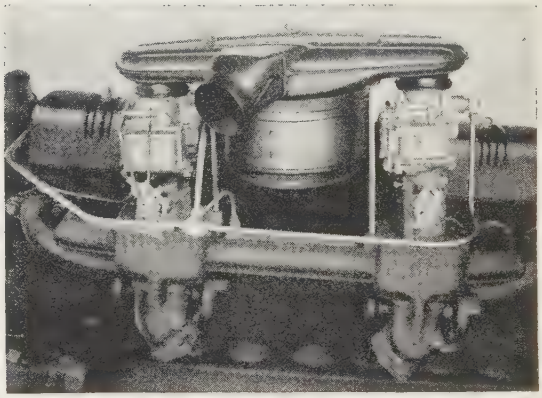
bove, right: BUILT-IN RUNNING BOARDS were featured on many 941 cars

ight: PLYMOUTH sedan of 1941

elow, left: 1941 CHEVROLET five-passenger coupe

elow, right: DUAL CARBURETTORS of the 1941 Buick "Fireball" ngine

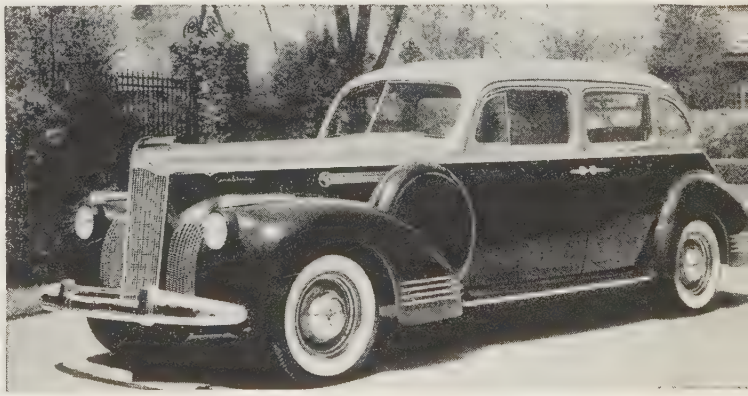




ight: THE PACKARD of 1941 was further streamlined, but kept s traditional radiator design

elow, left: THE 1941 LINCOLN CONTINENTAL had a marked uropean appearance

elow, right: SAFETY WHEEL RIMS appeared on all 1941 Chrysler odels. This rim keeps tires firmly in place, even after blow-outs



setting up machine tools for making trucks, aeroplane engines, boat and submarine diesel engines, tanks, machine guns, cartridges and many other things necessary for the rearmament program. The automobile industry will reach the high production stage on this work sometime during 1941. At the close of the year 1940 the preliminary work was well under way and efforts were being made to speed up the production. A number of executives from the automobile industry were directing various phases of this work for the government. William S. Knudsen, director of the Office of Production Management, was the leading automotive executive chosen for government work.

In 1940 motor vehicle production again showed an increase over the previous year. Factory sales were 4,285,000, an increase of 19·5%. Motor vehicle registration in the United States was 31,950,000, which was 69% of the total world registration. Exports amounted to but 6% of production, due to the closing of many foreign markets by the war. Employment in auto, body and parts factories was 443,000.

The 1940 traffic accident rate showed an increase of 6% over that of the year 1939. The increase in accidents was due to the increase in travel and the mileage rates were only slightly higher than the 1939 rate. Best estimates place motor vehicle fatalities at 34,400 for 1940.

Passenger Car Bodies.—The outside appearance of the new models continued the trend set several years ago with wider seats, longer bodies, more glass area and stiffer construction. Hoods were more often locked from the driver's seat. Either concealed running boards or no running boards were used on most bodies. Direction signals were made available on more models. One new model had a unit frame and body construction.

Many changes and additions were made to the interior appointments. Improvements in heaters and ventilators were general. An air cooling system was continued by one manufacturer. Power operated windows were featured on one model. Windows were raised and lowered by hydraulic pistons controlled by a push button in the arm rests. More pounds of plastics were used, especially on the dash.

Chassis.—Many changes and innovations appeared on the 1941 chassis. Frames were redesigned to carry the heavier bodies and to permit lower cars. One new type independent front wheel suspension was introduced and additional models used coil springs in the rear. A safety rim was used on one line of products so that flat tires would not be thrown off the rim at high speeds. A ball bearing worm and nut steering gear was adopted on several lines to reduce steering effort. Synthetic rubber tires were introduced as replacement equipment. The successful development of synthetic rubber for tires eliminated one more strategic material from the list of products in which America is dependent upon a foreign source of supply. While these were not used as standard equipment, the industry was interested in this alternate source of such a fundamental product.

Transmissions.—Transmissions incorporating a fluid clutch unit were made standard equipment on additional models. Several automatic and semi-automatic transmissions using a fluid coupling were being used. All of these devices eliminated much of the gear shifting and one completely eliminated the clutch pedal. Other devices were developed to simplify gear shifting. Vacuum-controlled clutches and gearshifts were standard on many lines and automatic overdrives were continued on many others. A combination of a four-speed transmission with a friction clutch and a fluid drive unit was used on one model. In 1940, the greatest interest in mechanical features seemed to centre around the transmission. Automatic transmissions not only simplified the operation of the automobile but, with many of the new devices, they added to the performance and economy as well.

Statistics of the Automobile Industry
1940 Calendar Year

Production and Value	
Car and truck factory sales, from U.S. plants	4,476,000
Passenger Cars	3,705,000
Motor Trucks	771,000
Percentage increase over 1939. Motor Vehicles	25%
Wholesale value of cars, from U.S. plants	$2,413,800,000
Wholesale value of trucks, from U.S. plants	$ 598,300,000
Wholesale value of cars and trucks combined	$3,012,100,000
Wholesale value of parts, accessories and tires for replacement, and service equipment	$1,250,000,000
Motor vehicles, accessories, service equipment and replacements of parts and tires	$4,262,100,000
Registration	
Motor vehicles registered in U.S.	31,950,000
Motor Cars	27,300,000
Motor Trucks	4,650,000
Per cent of new vehicles sold in U.S. required for replacement of vehicles scrapped (average 1930–40)	84%
World registration of motor vehicles	47,000,000
Per cent of World's automobiles in U.S.	69%
Taxes	
Total motor vehicle user taxes	$1,772,000,000
Gasoline taxes, federal, state and municipal	$1,120,000,000
Percentage motor user taxes to all taxes from all sources, federal, state and local	11%
Foreign Sales	
Number of motor vehicles exported from United States	230,500
Per cent of U.S. production exported	5.1%
Value of motor vehicles, parts and tires, exported from U.S.	$280,000,000
Employment	
Employment in auto, auto body and parts factories	443,000
Weekly payroll, wages	$15,400,000
Motor Vehicle Retail Business	
Total car and truck dealers	41,494
Total repair shops	87,366
Total retail outlets, duplications eliminated	94,985
Wholesalers	6,264
Retail gasoline outlets	400,000
Automobile's Relation to Other Business	
Automotive industry is the largest purchaser of gasoline, rubber, steel, malleable iron, lubricating oil, plate glass, nickel and lead.	
Railroad carloads of automotive freight shipped	3,755,000
Used in Automobile Industry	
Rubber	80%
Steel	17%
Lumber, hardwood	4.5%
Copper	13%
Lead	34%
Zinc	11%
Tin	12%
Aluminium	10%
Nickel	23%
Gasoline	90%
Gasoline used by motor vehicles (gallons)	22,044,128,000
Motor Vehicle Use	
Number of communities served only by motor vehicles	48,000
Number of children carried to school daily by buses	3,750,000
Mileage of rural highways used by U.S. Post Office Department for delivery of mail	1,392,657
Per cent of motor vehicles on farms and in villages under 2,500 population	41%
Per cent of trucks privately owned and operated	86%
Per cent of live stock hauled to market by truck	53%
Motor Trucks and Buses	
Motor trucks in use	4,650,000
Total special motor truck taxes	$460,000,000
Taxes per dollar of gross revenue, for-hire trucks	6.8c
Number of bus and truck drivers	3,900,000
Motor buses in use	144,000

Engines.—Power outputs of most engines were increased to take care of the increased size and weight of the automobile. Hi

tane fuels of as much as 80 octane number were made available the petroleum industry. This allowed the use of compression ios as high as 7·25 to 1. Small car engines produced a maxi-ım of about 85 h.p. and larger engines up to 165 h.p. This ;her output was made possible by many design changes in lves, cooling, pistons, combustion chambers and spark plugs. A w type bearing in which a porous matrix on a steel back is filled th a soft bearing material was introduced on one model. A dual :buretter fuel system was developed for one line of cars. Econ-ıy and power output were thus increased.

Interchangeable engines were introduced. In several models. her a six- or an eight-cylinder engine can be fitted to the ne chassis. Instead of two lines of cars, these manufacturers ve two lines of engines to fit one line of bodies. (*See* also ASOLINE.) (C. F. KE.)

otta, Giuseppe (1871–1940), Swiss statesman and scholar, was born in Airolo, Switzerland, Dec. 29. attended the universities of Fribourg, Munich and Heidelberg d received the degree of doctor of law at the age of 22. He gan the practice of his profession at Airolo, and soon inter-ed himself in politics. He was elected to the national council 1899, was chosen president of Switzerland in 1915 and was re-cted four times, the last time in 1937. He was president when League of Nations held its first session at Geneva and was de honorary president of the league. When he died at Berne, n. 23, he was serving as chief of the Swiss political depart-nt.

ount Holyoke College, pioneer American institution for the higher education of men founded in 1837 by Mary Lyon and situated at South dley, Mass. The campus covers 270 ac. with over 70 buildings. gistration figures for the 1940–41 session included 1,027 under-duates and 64 graduate students, a total of 1,091. The teaching ulty numbered 131; the endowment fund as of June 1940 was 346,489; the total college income for 1939 was $1,321,086. fts received during the year 1939–40 amounted to $118,556. (R. G. HA.)

ozambique: *see* PORTUGUESE COLONIAL EMPIRE.
uang Thai: *see* SIAM.

uck, Karl (1859–1940), German musician noted as the interpreter of Wagnerian music at the Bayreuth tival, was born in Bavaria, Oct. 22, the son of a councillor in Bavarian government. He displayed musical ability at an early and when he was 11 he made his debut as a pianist at a cham-music concert. He later played the violin in a symphony chestra. He entered the University of Heidelberg at the age of and the next year transferred to the University of Leipzig to dy philosophy and classical philology, while he was perfecting musical education at the Leipzig conservatory. At the age of he received his doctor's degree from the university and ap-ared as a solo pianist at a concert. He thereafter devoted him-f entirely to music, becoming in the course of time the conduc-of the Berlin Royal Opera. He went to the United States in 06 as conductor of the Boston Symphony orchestra, a post he d until 1908. He was recalled to Boston in 1912 and conducted orchestra again until 1918. When the United States entered World War in 1917 he refused to lead the orchestra in "The ır Spangled Banner," and was interned as an enemy alien. After war he was released and returned to Germany. Chancellor tler conferred the Order of the German Eagle on him in 1933. died in Stuttgart, March 4.

Mules: *see* HORSES.
Multiple Shop: *see* CHAIN STORES.

Municipal Government. U.S. municipal government toward the close of 1940 met the first impact of the national defence program. While every local government service was potentially involved, civil defence, housing, personnel, planning and finance were first affected. But even here it can hardly be said that the new local programs assumed definite shape. However, the trends were clearly indicated in line with the national defence needs.

Defence Developments.—To facilitate co-ordination between the federal, state, and local governmental levels, the advisory commission to the council of national defence set up a division of state and local co-operation in Aug. 1940. The division serves as a channel of communication and of planning between governmental agencies and particularly between the national, state and local defence councils. By the end of the year, defence councils or co-ordinators were established in about 36 states and 700 municipalities, including cities and counties. New York state alone had more than 60 official local defence councils.

Plans for the emergency mobilization of state and local police forces for civil defence emerged in a number of states. The police resources of the state, most of which are city policemen and their equipment, were organized into potential mobilization areas under the direct control of the governor. New York state assumed the lead in this development, and several additional states, notably Virginia and New Jersey, followed the general outline of the New York plan.

A considerable number of states and municipalities made provision for their employees who are called into military service. Only a few cities made plans to encourage military service by paying the salary differential between civil and military compensation, as was done so frequently in 1917. A number of city ordinances provide, however, for the reinstatement of employees on their return and some specifically preserve their vacation, sick leave, promotion or retirement privileges.

Selective service boards were organized under the Selective Service law throughout the nation in Oct. 1940. In the cities, the personnel of the draft boards was generally nominated by the mayor, and schools or other public offices were furnished for their meetings. Registration was handled through the regular local election machinery.

Deaths from traffic accidents throughout the year showed a definite increase over those for 1939, reversing the trend of previous years. There was an increase also in most of the more serious crimes over the earlier part of the year compared with the same period of the preceding year, notably in negligent manslaughter (traffic accidents), larceny and aggravated assault. Robberies decreased over the same period.

Housing.—Local housing authorities have been authorized in at least 38 states. There were 507 such authorities, 203 of which were county authorities, as of Nov. 1, 1940; there were but 46 on Nov. 1, 1937. By the middle of Dec. 1940, 335 housing projects were reported as either under construction or completed, a gain of approximately 200 during the year. Of these, more than 100 were partially or completely occupied. For the purpose of determining actual housing needs in the defence program, a defence housing co-ordinator was set up in the national defence advisory commission, and the president, on the recommendation of the housing co-ordinator, approved immediate construction of housing projects in 63 vital defence areas spread over 28 states and territories, to provide for increases in army, navy and industrial personnel. Funds were appropriated to several federal agencies in aid of the defence housing program and the United States

Housing authority diverted part of its existing appropriation to local housing authorities specifically for defence housing needs. The first two defence housing projects were opened at Montgomery, Ala., and Pensacola, Fla., before the end of the year.

The 1940 Census.—The predicted decline in the rate of urban population growth was fully confirmed by the preliminary figures of the 1940 census. While the total urban population increased 7·9% for the decade 1930–1940, the rate of increase was less than one-third of the rate for the preceding decade, when the increase was 27·3%. Of the 92 cities whose population exceeds 100,000 in 1940, 28 or almost one-third declined in population during the past decade, whereas but four of them experienced a decline between 1920 and 1930. Of the 313 cities with a population between 25,000 and 100,000, 76 experienced a decrease since 1930, and of the 663 cities with a population from 10,000 to 25,000, 157 showed a loss. Miami, San Diego and Washington showed the biggest percentage increases among the larger cities, while the northern industrial cities showed the least rapid growth. The available data indicated that in the metropolitan areas the outlying suburbs continued to increase their population but at a much slower pace than in the prior decade. (*See* also CENSUS, 1940.)

Problems of Declining Cities.—The revelations of the census figures pose questions of serious import to the cities. On the basis of a ten-year survey covering the years 1930–1940, it appears that cities with a declining population had increased their tax rate twice as much as the growing cities, while their assessed valuations had declined to a greater extent. In the metropolitan centres, land use and land values have been seriously affected by the migration of population to the outlying suburbs, either within or without the city limits, leaving to the central city baffling problems of tax delinquency, reduced valuations, and increased tax burdens in either case. Apparently the United States' 200-year urban land boom was over by 1940.

Finance.—On the whole, the bonded indebtedness of cities declined. New municipal borrowing increased sharply toward the close of the year, however, due in part to the desire to take advantage of the favourable bond market and in part to fear of removal of the tax exempt feature of municipal bonds by the next congress. New York city indulged in particularly heavy borrowing, due largely to transit unification under city management.

Municipal debt defaults decreased in number by about 200 between Dec. 1939 and Dec. 1940. Wider adoption of long-term budgeting programs was in evidence, directly encouraged by the National Resources Planning board. Local governmental expenditures reached a new high in 1940 and local tax collections maintained their upward trend. The improved condition in municipal tax delinquency continued. In New York city, only 8·7% of the property tax levy remained uncollected at the close of the fiscal year—its best record in a generation. The municipal bond market was marked by an extraordinary resiliency. The index of average yields for 20 large cities dropped to 2·18% on Dec. 1, 1940—an all-time low. Commodity prices paid by the cities declined gradually until August when a moderate upturn commenced, which was accelerated, however, in the closing weeks of the year.

Relief.—Relief loads began to drop significantly in the latter part of 1940. In the heavy industry centres with early war and defence contracts the first labour shortages appeared. But even in New York city the relief load decreased to about one-half of the total at the high point in Oct. 1935. During 1940 there was a gradual reduction totalling about 7% in the urban WPA employment rolls. In Dec. 1940, there were in New York city 128,000 families on regular home relief, and 103,000 on WPA as compared with 149,000 and 110,000, respectively, in Jan. 1939. A significant factor was the development of a considerable turnover of both WPA and home relief clients. A study of the hea of families on relief in Pittsfield, Mass., showed that 42% we in bad health; 79% had never entered high school; 33% we broken families; 50% were over 65 years old; and 66% we labourers.

New York City.—In the country's largest municipality, one the outstanding events of the year was the retention by popul vote of the proportional system of voting for the members of t city council. This was the third successive time the voters h expressed themselves affirmatively on this issue. The city al completed unification of its rapid transit lines under munici ownership and operation after 20 years of effort, and conclud the construction of a new subway—probably its last. The Ci Planning commission, after three years' preparation, presented elaborate 50-year land use plan for the development of the ci of the future on a comprehensive scale, with due regard to t fact that the city had about reached the limits of its populati growth. The popular movement for the abolition of some of t superfluous county offices still saddled on the city taxpaye ended abruptly when the initiative petitions were invalidated the courts.

City Manager Plan.—Eighteen municipalities in the Unit States adopted council-manager government in 1940. The pl was in effect in a total of 493 cities and counties of the count on Dec. 31, 1940. In two instances the plan was abandoned. striking victory for the plan, as well as for proportional represe tation, was won in Cambridge, Mass. The year was marked al by publication of a survey and evaluation of the city manag plan in 50 cities, conducted under the auspices of the Committ on Public Administration of the Social Science Research counc

(L. GU.)

Munitions of War. Man does not live by bread alone, n do armies win by munitions alon That nation which would impose its will upon another, or res such imposition, must possess munitions not only in stupendo quantity, but of excellent quality, latest design, and operated corps upon corps of super specialists. These requirements sat fied, and buttressed with a sufficiency of man power, adequate morale, the combination becomes well nigh unbeatable.

In the fall of 1939, and throughout 1940, the German milita machine met these requirements, while every object of its ru attentions proved lacking in one or more. All were inferior in power, whereas air superiority was a *sine qua non* to success. likewise soon became apparent that no contestant could gain, a hold, vital objectives unless possessed of tanks, in numbers most limitless. France boasted thousands, but mostly of Wo War vintage. Unable to steel itself to the financial sacrifice cident to their replacement with others of modern design, Fran puttered along with what it had. Britain was almost equa lacking in the foresight necessary to the junking of obsol equipment, or to the adequate production of new and bet types. Though making a magnificent gesture at rearmament, remained a gesture only. Came the Day of Judgment, and t swastika floated over Paris. But for the providential existence the English channel, it would have waved over London as w

What miraculous properties were to be found in the munitic of 1940 as against those of 1939—of 1914–18? None. In t weapons themselves there was little new or startling. It was their mass employment that the revolutionary appeared. In co trast with the homoeopathic pilules in which formerly admin tered, force was now applied in heroic doses. An objective agai which in 1918 an infantry attack would have been implemented perhaps a score of tanks and as many aeroplanes, to succeed fail after hours of bloody stalemate, with unnumbered casualt

n both sides, was in 1940 overwhelmed in a matter of minutes by terally hundreds of bombing planes, followed by as many tanks, lmost without loss to the attacker.

Two facts stand out, the first of which has already been sugested, to wit: the modern campaign is increasingly three-dimenional, rendered so by the perfection of the aeroplane. The second, ased upon the wider realization that munitions power is as imortant as man power, if not more so, is that the campaign is no onger conducted solely against the armed forces of an opponent; is directed at every material resource, immediate or remote, anihate or inanimate, armed or unarmed, which that opponent can nuster in a military effort, for "munitions" possess an all-inclusive onnotation. Participants in the War of 1914–18 thought that hey were engaged in such a conflict. Those aligned against one nother in the contest of 1940 *knew* that they were. With this in nind, one may examine the actual instrumentalities employed, reaining ever alive however to the fact, already accented, that the haracteristics of the weapons involved are of far less import than he quantities in which available or the skill with which applied.

Air Offence.—Western Europe awakened on May 10, 1940 to he fact that lightning war, with screaming death raining from bove, the threat of which Germany had so often used to wring oncessions from nations all too conscious of their military deiciencies, was something more than an unpleasant dream. And lespite the lessons of Poland, where identical tactics had been employed, if in lesser degree, its peoples proved wholly unprepared o stem the tides that surged upon them from air and land. Credble reports indicate that, between May 10 and 13, 900 Allied lanes were destroyed, two-thirds of these while yet upon the round. In the air, casualties were so fearfully high (the British n May 14 were said to have lost 40 of 95 bombers detailed to a ingle mission) that France and Britain soon ceased all attempts t daylight bombing. Germany, outnumbering the combined Allied ir forces in the proportion of three to two, and more (Britain lid not dare throw her full strength into the contest, lest she leave ier own nerve centres unprotected); and enjoying a unity of ommand which her opponents ever lacked, gave short shrift to he modest fleets of Holland (200 ships), Belgium (400) and France (1,200). And, as an example of what could happen to hose who defied German will, Germany razed in two short hours (12 noon to 2 P.M., May 14), in a succession of intensive assaults y massed flights of bombers, no less than 26,000 buildings in the ity of Rotterdam, a metropolis of 600,000, this after the Dutch commander had made the official signal of surrender. (The atendant loss of life, confined principally to the civilian populace, was estimated at 25,000.) Closer to the frontiers, thoughtful German aviators directed their missiles not at road surfaces, but slightly to one side. Providing the aim was accurate, damage to hostile forces was in no wise lessened, and the highways remained intact for early use by their own onrushing mechanized organizations.

For the most part, no great differences existed in the matériel employed by the several contestants. British fighter planes, chiefly Hurricanes and Spitfires (two new types, the Whirlwind and the Tornado came into service just as 1940 ended) possessed approximately the same speed (337–365 m.p.h.) as Germany's Heinkels and Messerschmitts (358–365 m.p.h.), but were inferior in armament, mounting machine guns only, as against similar weapons augmented by 37 mm. cannon, which the Messerschmitts possessed. This installation upon aeroplanes of ordnance ever increasing in calibre rendered necessary the provision of at least some armour protection for the pilot and certain of the more vital parts of his ship. Likewise the huge volume of fire delivered by multiple machine guns (the Spitfire and Hurricane, with eight each, can discharge their weapons at the rate of 9,600 rounds a minute) led to the hurried development, by all concerned, of self-sealing gas tanks, and provision for the installation of these in ships ordered for future delivery. In the U.S.A. there appeared such a tank with walls built up of a combination of synthetic resins and latex, the sealing properties of which, conferred by colloidal characteristics possessed by these constituents, functioned on a physical rather than a chemical basis, thus giving it superiority over those of chemical type in which the active agents, when called upon to seal punctures, invariably contaminate the gasoline within, with eventual deleterious effect upon the motor. Aviators' self-heating suits were another United States contribution to the armamentarium of the flyer. In these the rubber, converted from a non-conducting to a conducting agent by special treatment applied during its processing, will pass, but resist, a current. As a result, the entire substance of a garment so treated will, when electrically energized, give forth an even and continuous emission of radiant heat so long as a current of proper intensity passes through it.

Yet another advance, also of United States origin, was the supplanting, by a new system of illumination, of conventional methods of lighting aeroplane instruments. So-called "luminous" paint, which actually in its normal state lacks the power to emit light rays, but acquires this when activated by ultra-violet radiation directed upon it from suitable sources, is applied to the dials. When energized by the ultra-violet, it glows with a soft fluorescence, adequately illuminating all navigating devices, practically without eyestrain to the pilot.

In the sphere of the bomber, neither Germany nor Britain appeared to have developed ships equal in certain respects to the U.S. B-17 and B-24 "Flying Fortresses." These, powered by four 1,200-h.p. motors, develop a top speed of 250 m.p.h. (latest types would do 300), and can carry a bomb load of $4\frac{1}{2}$–5 tons over a cruising range of 3,000–4,000 miles. All early models of these were, however, deficient in that they lacked a rear gun turret, and were thus vulnerable to attack from that quarter, a drawback which was being corrected in later specimens. British bombers consisted chiefly of Blenheims, Wellingtons, Hampdens and Lockheed-Hudsons, most of which were incapable of carrying more than a single ton of explosives over a prolonged flight. Against these were pitted the heavy Junkers 87, Germany's standard dive bomber, with a top speed of 242 m.p.h., carrying one 550- or 1,100-lb. bomb beneath the pilot and four 110-pdrs. in racks under the wings; the Junkers 88 and 96 and, largest of all (but at the same time one of the most vulnerable), the Dornier 17. In the lighter field Britain faced the Heinkel 118 and 120 and the Junkers 87B (known also as the "Stuka"), a single motor monoplane of superlative speed and effectiveness. Carrying a solitary bomb (in its nose) and aligning itself directly upon a target, it does not, like other "diving" ships, straighten out before releasing its missile, but lets this go an instant prior to terminating the dive, by which time it has approached perilously close to the object of attack. (The three Stukas which on June 17 destroyed the British liner "Lancastria," with the loss of 2,800 of those on board, the third of three waves of those which attacked the vessel, were all said to have plummeted into the sea within 200 yards of their victim.) So speedy and manoeuvrable that its twists and turns enabled it to defy the calculations of mechanical "predictors" (amazingly complex instruments employed for regulating automatically the aim of anti-aircraft artillery), it was the air marvel of the year, though for some reason best known to the German high command they were rarely employed against British targets during the last four months of 1940.

Other German bombers, however, suitably escorted by fighters in a ratio of some two to one or more, found such employment almost daily during the early summer and later, after massed day-

light raids, with their losses averaging 40% of assaulting ships, had proved too costly for constant indulgence almost nightly over London or other important objectives. And despite balloon barrages and the superhuman effort of the royal air force, casualty lists mounted steadily. Yet the attendant limitation to Britain's industrial productive capacity, the prime object of these assaults, was estimated at not over 5% to 10%.

Ringing the objective with smoke bombs by day or incendiaries by night, advance flights of fighters prepared the way for the bombers that followed. Estimates indicated that during the last three months of 1940 London was bashed by a total of some 100,000 bombs of all sizes and types. Of these about 50% were incendiaries, any one capable of initiating a devastating conflagration if not immediately quenched; 25% high explosive types weighing from 25 to 1,000 lb. and detonating on impact; 25% of the "time" variety, designed to explode at intervals of from a few minutes to 72 hours; and 5% "land mines," huge two-ton affairs which, floating to earth on parachutes, bore their explosive charges within relatively fragile containers wholly lacking in penetrative power, but exterminating by concussion all forms of life within their radius of action.

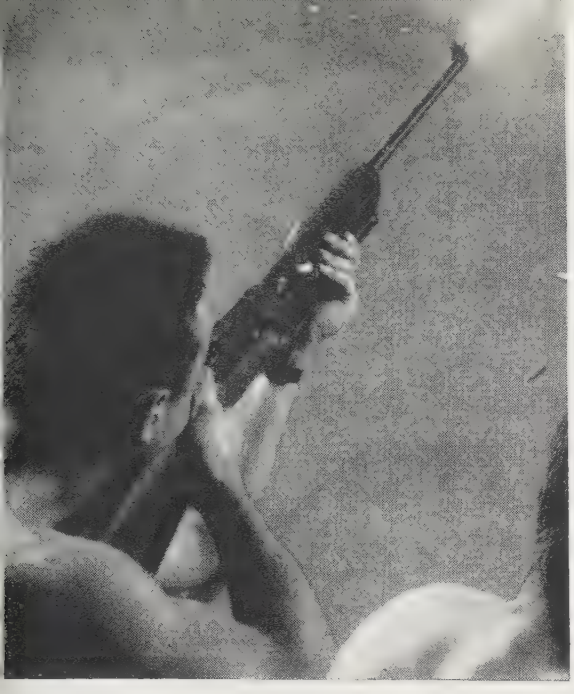
The widespread destruction upon the ground of defensive air matériel in the initial phases of a lightning attack led to hurried efforts toward the devising of satisfactory means of protection against similar sudden and devastating onslaughts in the future. The most effective of these, subterranean hangars, proved too expensive and time-consuming in construction to offer a complete solution to the problem. One suggestion emanating from the United States was that "flight strips" be established on public lands adjacent to and in conjunction with military highways. These, properly surfaced, would constitute runways 200 ft. in width and not less than 1,800 ft. long, and it appeared probable that the location of a sufficiency of such havens in suitable areas would offer relatively safe (because adequately dispersed) points upon which to base scattered units of friendly air forces.

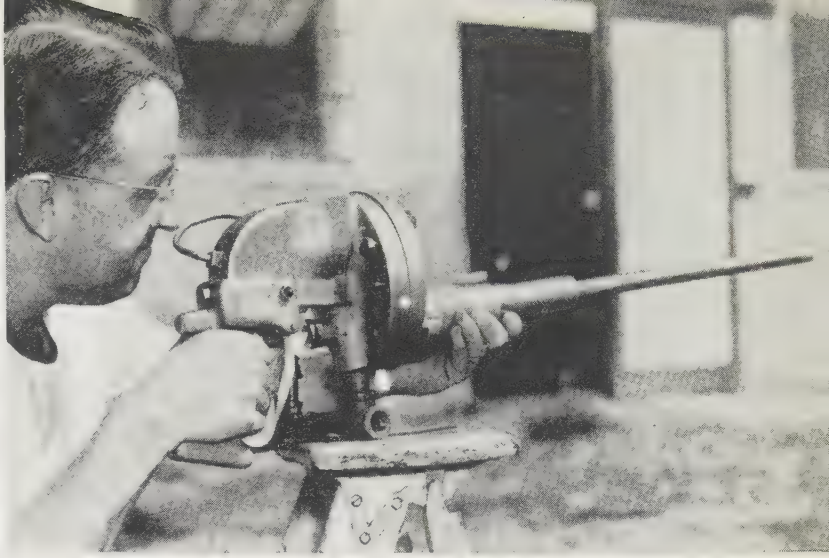
Air Tactics.—The possibility of air-transported tanks figuring in the long deferred but ever imminent invasion of Britain, became real when Russia demonstrated experimentally the practicability of such a measure. The same nation had previously solved the problem of setting down planes on rough but relatively flat terrains in sub-freezing weather, by flooding these to a depth of a few inches, then landing its ships on the ice which soon formed. Infantry movement by air figured largely in Germany's invasion of Norway and the Low Countries, Germany having available for this purpose hordes of old Junkers transport planes, each capable of carrying 20 infantrymen with full equipment. Germany's wide employment of parachute troops at exactly the right times and places laid the groundwork for the capture of many airports and other strategically important points, and astonished a world whose memory was so short as to forget that the practicability of such measures, first demonstrated in the United States some ten years earlier, had been toyed with almost continuously by one or more of the great powers ever since. Credible reports have it that even troop-laden gliders, towed by aeroplanes and cast loose at the psychological moment, managed to manoeuvre to landings within the enclosures of certain Belgian fortresses, spewing out soldiers who, laden with tanks of ethylene (a gas which produces general anaesthesia) and arsenical smokes (nausea-inducing), emptied these into exposed ventilator ports, capitulation of the amazed and discomfited defenders speedily resulting.

Air Technology.—As in the past, ship speeds continued to increase, engine power ratings to advance, and the size, weight and carrying capacity of bomber types to be augmented. The United States placed substantial orders for the new Lockheed P-38 interceptor, a two-motored ship said to be capable of a top speed 400 m.p.h. or more, a cruising range of 1,100 mi., and of climbi to an altitude of a mile in four minutes. Another fast pursu plane was the Grumman, with a speed equalling or exceeding th of the P-38. Armed with two 37 mm. cannon and four machi guns, both the U.S. army and navy were acquiring specimen those for the former service being equipped with the Allis liquid-cooled engine of 1,090 h.p. This embodies a 12-cylind power plant with two opposed banks of six cylinders mount in conventional "V" formation and differing radically from t radial type of motor which is commonly air-cooled and exhibi one or two banks of cylinders disposed like the spokes of a whe This second type was much the more common, but the U.S. arm air corps expressed full satisfaction with the performance of t "in line" type of motor with its liquid cooling system, and co firmed this by placing huge orders for combat planes in whic power plants of this character were specified.

Anti-Aircraft.—Tendencies toward heavier and longer-rangin anti-aircraft cannon for use against high-flying planes, and f more mobile specimens with increased rates of fire in the small calibres, continued manifest. One result was the official adopti by the United States as its largest mobile anti-aircraft weap of the 90-mm. (3·54-in.) piece which had long been under te This, with its range of 36,000 ft., matched the 3·7-in. British A cannon which had performed so creditably. Thus became rel gated to secondary tasks the erstwhile pre-eminent 75-mm. (3-in gun with its 20,000-ft. range which, though able ten years earli to interdict the passage of any bomber then known, was now in potent against those of 1940 which, flying at 300 m.p.h. or mor could register hits against area objectives 25,000–28,000 ft. belo Still larger calibres of anti-aircraft matériel were being employe on fixed mounts (105 mm. and over), while against low-flyin planes, concentrated small arms fire, machine guns in ·30 and ·5 calibres and small cannon of 20-, 37- and 47-mm. bore prove effective upon occasion. Even so, records indicated that in th "Battle of Britain" not more than 3% to 5% of attacking plan had been brought down by anti-aircraft fire. Nevertheless t greatly increased accuracy of this type of weapon was well illu trated by the fact that Finland expended, in the brief war wit Russia, exactly 54 anti-aircraft shells per aeroplane destroye while the figures for a comparable feat in 1914 were 11,000; i 1918, 6,000.

Balloon Barrage.—The balloon barrage continued to rend effective service in the defence of London, though no attempt w made completely to encircle that city with such devices, since th number required for this would have been prohibitive. (To det venturesome enemy aircraft from attempts to effect passage b tween their restraining cables, these must be spaced not ov 300 ft. apart.) Further, they were useful only at night or whe hidden by cloud banks, due to their ready visibility and high d gree of vulnerability (being hydrogen filled) under good atmo pheric conditions. The ultimate height to which they were r leased approximated 20,000 ft., though it was reported that ce tain French, Italian and German barrages managed, through th employment of tandem balloons, to ascend as high as 33,000 f (The maximum World War range was 8,000 ft., but at that perio contemporary bombers were limited to a ceiling of 11,000 ft. In rural areas, special defence workers crisscrossed with shallo trenches, calculated to bring swift disaster upon planes attemptin to choose such a landing spot, any open level fields which the figured might prove tempting to the air forces of an invader. O the seas, merchant vessels discovered that by towing captive ba loons aloft and astern they could make air attacks extreme hazardous from the rear by hostile dive bombers. Naval unit despite their anti-aircraft armament, suffered constantly und





oove, left: THE JOHNSON RIFLE, considered by many to be perior to the U.S. Garand, was the centre of a military con-oversy in 1940

oove, right: NEW U.S. SILENT RIFLE demonstrated in 1940. sing compressed air instead of explosive charges, it fires 10,000 ots a minute without overheating

ight: AMERICAN 8-in. gun on railway mount

elow, left: POWERFUL 90-MM. ANTI-AIRCRAFT GUN adopted the U.S. army March 18, 1940. The shell on exploding will stroy aircraft within a range of 150 feet

elow, right: THE "MOLOTOV BREADBASKET," a Russian eapon used against the Finns, is a whirling container, dropped om planes, which sprays out incendiary bombs

the pounding of hostile air arms, many lesser vessels being disabled or even sunk, and certain heavier units heavily damaged, though no battleships were lost as a result of air bombing. Britain, in an effort to neutralize such attacks, incorporated at least two "anti-aircraft" vessels among her sea forces, and the United States navy, taking stock of happenings overseas, came to the conclusion that its fleet was decidedly lacking in anti-aircraft arms and armour, and requested a special appropriation of $300,000,000 to remedy deficiencies.

Mechanization.—Second only in importance to their arms became the mechanized units of the various warring nations. The backbone of these were the tanks (light, medium, and heavy) which, when employed in sufficient numbers and with proper support (motorcycle units; motor-drawn infantry) close behind, proved almost invincible. As in the field of the aeroplane, the tank was steadily becoming more heavily armed and armoured, carrying in some instances guns of calibres up to 155 mm. (6 in.) and armour capable of sustaining hits by weapons of 75 mm. (3 in.) calibre. The United States was concentrating upon the development of a light tank of about 13 tons and a medium type of approximately 30 tons. And while lessons learned abroad were resulting in constantly changing specifications, late deliveries of a given model embodying characteristics not possessed by earlier specimens, the lighter variety was for the most part capable of a speed of 35–40 m.p.h., carried a crew of four, armament of four machine guns and one high-velocity 37-mm. cannon, possessed two-way radio facilities and had a mobility of 2,000 mi. (as against a weight of 7½ tons, speed of 4 m.p.h., crew of two, one .30-calibre machine gun or one low-velocity 37-mm. cannon, no radio and a 50-mi. mobility for its 1914–18 World War counterpart). Similarly, the medium type had a speed of 30 m.p.h. or better, crew of six, one high-velocity 37-mm. gun and eight machine guns, two-way radio and comparable mobility. Still a third (heavy) type of approximately 50 tons was projected, but its specifications were yet to take final form when 1940 ended. One outstanding improvement embodied in the 1940 product involved the replacement of all-steel track links with others of a new type wherein solid rubber blocks were cemented to steel treads, devices which by actual test proved to give eight times the mileage to be had from other types.

Another innovation, long awaited, was the introduction of the diesel motor, a certain proportion of the light tanks now being powered with engines of this type. And the General Motors corporation, foreseeing their wider employment, promptly commenced to manufacture two-cycle diesels of from four to 12 cylinders, designed for installation in tanks of all sizes and weights.

Special flame-throwing tanks said to be capable of projecting their fiery mixtures over ranges up to 100 yd. were reported to have figured prominently in the general German assault against her western neighbours which commenced on May 10, as were numbers of the huge 70-ton break-through types which Germany was credited with possessing. The preponderance of Germany's tank matériel, however, appears to have been made up of three varieties: a light, 6-ton model armed with two machine guns of 7·9 mm. calibre; a medium type of 12–15 tons with similar armament, augmented by a 37-mm. cannon; and a heavy type (20–25 tons) mounting two machine guns and a cannon of 75 mm. Recognizing the new significance of the tank and its associated vehicles, the United States undertook to incorporate in its military establishment what it chose to designate as an "armoured force," composed of mechanized units formerly parts of, but now detached from, the infantry and cavalry arms, its commanding general responsible to the head of neither of these, but directly to the chief of staff. And while tables of organization were constantly undergoing change, the fact remained that tank allocations to tactical units reached in 1940 figures representing an increase several hundred per cent over those formerly considered adequate. Another definite trend was toward an increased allotment of heavy weapons (machine guns, anti-tank guns and light mortars) to both infantry and cavalry organizations. One result rather startling in its implications was that the infantryman who, ever since the supersession centuries past of the pike by the firearm, had been first musketeer and later rifleman, relinquished probably for all time his traditional weapon. For by the end of 1940 two-thirds (during the World War, only one-fourth) of the enlisted personnel of a U.S. army infantry organization had been deprived of their rifles and assigned to the service of the newer agents of mass destruction. Not only was the old order changing; it was all but unrecognizable in the new. (*See* also AIR FORCES; ARMIES OF THE WORLD; EUROPEAN WAR; NAVIES OF THE WORLD.)

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Murray, Augustus Taber (1866–1940), professor emeritus of classical literature at Stanford university, was born in New York city, Oct. 29, a descendant of the man whose farm came to be known as Murray Hill. He was graduated from Haverford college in 1885 and in 1890 received a doctor's degree from Johns Hopkins. He then spent a year at the universities of Leipzig and Berlin. In 1892 he became the first professor of Greek at Stanford and was later made professor of classical literature. He served a year on the faculty of the American School of Classical Studies in Athens and translated the *Odyssey*, the *Iliad* and the private orations of Demosthenes for the Loeb Classical library. During the administration of President Hoover he was minister of the Friends' meeting in Washington attended by the president. He died in Palo Alto, Calif., March 8.

Murray, Philip (1886–), U.S. labour leader who succeeded John L. Lewis as president of the Congress of Industrial Organizations in 1940. A native of Scotland, he was born in Blantyre May 25 and emigrated to the United States in 1902. Naturalized in 1911, he became a member of the international board of the United Mine Workers of America the next year, president of the union's fifth district in 1916, and international vice-president in 1920. During the war of 1914–18 he was a member of Pennsylvania's regional war labour board and served also on the National Bituminous Coal Production committee. In 1935 he was named to the National Industrial Recovery board and to the advisory council of the National Recovery administration.

Murray was Lewis's choice for second president of the C.I.O. after Lewis had fulfilled his pre-election promise to resign if President Roosevelt was elected for a third term. Lewis, who continued to dominate the annual convention of the organization, personally nominated Murray, and the latter was elected unanimously Nov. 22 without an opposition candidate. Murray then announced that he would conform strictly to the policies outlined and followed by his predecessor.

Museum of Modern Art (N.Y.C.): *see* ART EXHIBITIONS.
Museums of Art: *see* ART GALLERIES AND ART MUSEUMS.

Music. Two tendencies marked the trend of music in the year 1940. The first was the centralizing of significant musical production in the new world and in the few corners of Europe untouched by the European War. The second was a changing

ttitude on the part of composers toward the fundamental tenets of their art. Neither of these two trends was entirely a product of this single year. They were partly a result of the war and partly the natural culmination of trends in the evolution of music.

Expression of a change of attitude was to be found in many writings of composers themselves and in the attitude of composers as it was reflected by critics. Virgil Thomson, composer of the opera *Four Saints in Three Acts* to a libretto by Gertrude Stein which made such a sensation in New York, and the new, provocative critic of the *New York Herald Tribune* published in the May-June issue of *Modern Music* an article "Paris, April 1940," which gives a most plain expression of this changing viewpoint.

"The lotus-land of whether surrealism is really gratuitous and whether such and such a picture by Picasso is really worth the price asked . . . that stormy lotus-land of commercialized high esthetics to which New York's Museum of Modern Art will long remain a monument, have quietly passed away. It is rather surprising and infinitely agreeable to find that poets now are writing poetry again rather than rhymes about current events; that painters paint objects, not ideas; that composers write music to please themselves. . . . Most surprising and agreeable of all is the fact that the young have again become visible as young . . . Instead of discussing esthetics with intelligence and politics with passion, as their elders did for so long, they are discussing esthetics with passion and politics with intelligence . . . Young poets and young painters . . . look us squarely in the eye and say 'hooey'. . ."

Another modern composer wrote in 1940 of the "dreary Esperanto of the twelve-tone system." And most illuminating of all was the sad regret of the ultramodern of yesterday who found that "as a whole the program offered nothing in the least problematical." In a word, there seemed to be a much more genuine concern on the part of the young composer in the expressive quality of his art, and a lesser concern with the foibles of ultramodernism as they had come to him from composers since 1920.

Great Britain.—The most poignant musical expressions from beleaguered Europe in 1940 were not from the concert stage. One read of British children singing "There will always be an England" as their boat sank beneath them in the mid-Atlantic; of lonesome Polish soldiers on the east coast of Scotland giving a concert of their own music with a few Scottish airs on the bagpipes; of intrepid performers in London's famous concert halls performing chamber music extemporaneously long past the end of the concert in order to keep the audience interested during an air raid. However, from the standpoint of serious musical contribution there was in 1940 not much to be reported from Britain. The concerts of the London Contemporary Music centre were not a great success. New works by Herbert Howells, Lennox Berkeley and Lord Berners were performed. A *String Quartet* by Herbert Murrills was the most interesting and was chosen to represent Great Britain at the International Society of Contemporary Music.

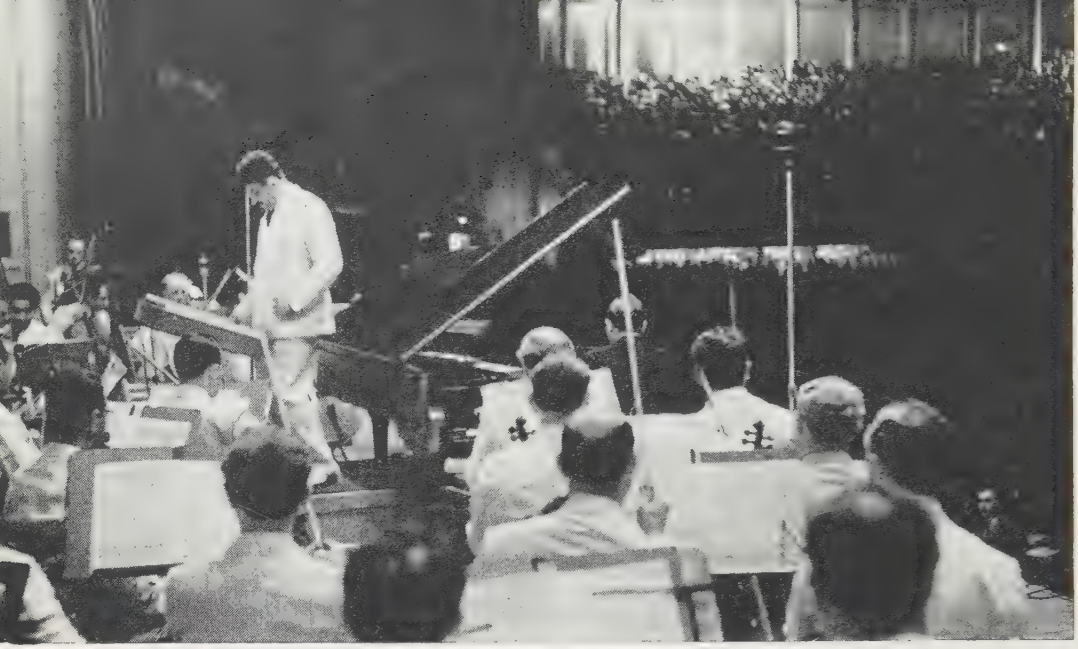
France.—One would hardly expect to find that there were important musical productions in France in 1940. Nevertheless there was a brilliant production of Darius Milhaud's *Medea* at the opera on May 8, two days before the German invasion of Holland and Belgium. The repeated performances on May 15 and 25 were, of course, not well attended, but it is amazing to think that the productions of this new modern work took place during the blackest hours of the battle of France. It is not easy to report on the musical activities in Germany. Opera performances continued, and, as usual, Wagner and the Italian operas made up the repertoire. Young composers, such as there are, seemed more interested in cantatas written for organization meetings than in any other form of music.

Italy.—Musical activity in Italy was more vital. This was probably due to the fact that the opera is a very important part of the social life of Italians, and new operas are necessary to give brilliance to the season. By far the most significant performance was Luigi Dallapiccola's opera on Antoine de Saint Exupery's *Night Flight* which was produced in Florence. There is a degree of interest in the fact that a famous English opera, Purcell's *Dido and Aeneas,* was given its first performance in Italy in 1940. In Rome, Ludovico Rocca's opera *Monte Ivnor* was successfully presented. In Genoa the opera *L'Intrusa,* composed in 1920 by the musicologist Guido Pannain on a text of Maeterlinck, was performed. We have reports that Malipiero, the most famous Italian composer living, finished an opera *Ecuba* after Euripides.

Switzerland.—When one turns to Switzerland one finds a much more brilliant and interesting musical season. Most outstanding occasion was the performance in Basle of Honegger's *La Danse des Morts.* As with other choral works by this composer, Paul Claudel was the librettist. This cantata was inspired by the figures of death in the old woodcuts, especially those by Holbein the younger. The musical score is one of Honegger's finest and to be ranked with *Roi David* and *Jeanne d'Arc.* Ansermet conducted several important new works on radio concerts: a *Concerto* for cello and orchestra by Henri Gagnehin, and new works by Frank Martin, Robert Oboussier, Roger Vuataz and Pierre Wissmer. *Hymnus,* a new work for orchestra by Willy Burkhard, who is considered the great hope of Swiss music, was performed in Winterthur, Geneva and Berne.

The Americas.—In the United States of America there was an increasing interest in the music of Latin America, partly because of organized concerts of the music of various southern neighbours, partly because of the reports of musical emissaries, and partly from the space given in U.S. musical periodicals to Latin-American activities. In Argentina there is an especially active school of composers. Twelve-tone music is written by the left-wing composer, Juan Carlos Paz. More typically Argentinean is the music of the "Grupo Renovacion," including the composers Juan José Castro, José Maria Castro, Jacobo Ficher and Honorio Siccardi. Juan José Castro is best known for his *Sinfonia Biblica* which was heard in New York city performed by the Schola Cantorum. A new ballet, *Offenbachiana,* was presented at the Colon. The younger Castro, José Maria, is more known for his chamber music, such as the *Sonata de Primavera* for piano and a *Sonata* for two cellos. A chamber music work by Jacobo Ficher was honoured by an Elizabeth S. Coolidge prize. A ballet on an Argentine-Indian folk subject by Alberto Ginastera was given its première in July. Brazilian music became more and more associated with the works of Villa-Lobos. *Choros No. 10* was presented in New York city with great success and was notable for its unusual orchestration. A new work, *Maracatu de Chico Rei,* by the Brazilian composer Francisco Mignone, was also presented by the Schola Cantorum. The Brazilian conductor and composer Burle Marx appeared in several cities of the United States after the concert of his music at the New York World's Fair. A symphonic work, *Pater Noster,* was presented during the season. A program of Mexican music was also heard in New York city and is available through Columbia records. There are three compositions by Chavez in this group and several by Louis Sandi. This music of Mexico appeals to one as the most vital and most beautiful that has come from Latin America. North American contacts with Latin America were encouraged by a good-will tour of an orchestra of brilliant youngsters, conducted by Stokowski, and a tour by Toscanini and his fine radio orchestra.

There can no longer be doubt that creative work in North America is flowering. A considerable number of new works by well-known composers were performed in 1940. In Chicago, Ill., a *Symphony* by John Alden Carpenter and a *Sinfonietta* by Leo Sowerby were presented. In Boston, Mass., a *Concertino* by Edward B. Hill was successful. Howard Hanson's *Third Symphony* proved an ambitious work with sound workmanship. The music of Frederick Jacobi was widely performed during the year. His *Piano Quintet* was played by the Pro Arte, the Gordon and the Coolidge quartets, with the composer's wife, Irene Jacobi,



A MEMORIAL CONCERT devoted to the music of George Gershwin was played by the New York Philharmonic-Symphony orchestra July 13, 1940, before 20,000 people in Lewisohn stadium, New York city

at the piano. A *String Quartet* written on the twelve-tone technique by Wallingford Riegger was performed by the Galimir quartet on two occasions. From Roy Harris came several new scores: the *Third Symphony,* widely performed in the course of the year; a new *Folk Song Symphony,* heard in Rochester, N.Y., and Cleveland, O.; *The American Creed,* commissioned by the Chicago Symphony orchestra; and *Four Preludes and Fugues* for string quartet, performed by the Galimir quartet at "Yaddo," Saratoga Springs, N.Y. Aaron Copland's music, written for the cinemas *Of Mice and Men* and *Our Town,* did much to make this composer more widely known. Walter Piston proved himself a composer of remarkable fecundity. Three major works of his were given their premières during the year: a new *Sonata* for violin and piano, a work of fine feeling and elegant craft; a *Concerto* for violin and orchestra; and a *Concerto* for piano and orchestra, both of the latter presented by the Boston Symphony orchestra. Two new recordings of Piston's works were issued by Columbia: the ballet, *The Incredible Flutist,* which was performed in 1939 and 1940 at the Festival of American Music at Rochester, and the new *Sonata* for violin and piano. It is entirely possible to judge Piston's position in American music from recordings that have been made. Roger Sessions had two new works performed. His *Concerto* for violin and orchestra was heard in Chicago. Two new piano pieces, *Pages from a Musical Diary,* were given in New York city. A new sextet for strings by Berezowsky was performed on several occasions. Otto Luening was heard in a *Sonata* for flute and piano and an orchestral work, *Prelude on a Hymn Tune by William Billings.* Chamber music by Quincy Porter and Richard Donovan was given at the Festival of American Music at "Yaddo." A *String Quartet* by Bernard Wagenaar was given by the League of Composers.

A number of younger American composers were being heard. In Canada the music of a French-Canadian Montreal composer, Hector Gratton, attracted attention. Several new works by David Diamond were given, the most interesting a *Concerto* for orchestra. David van Vactor, a flutist of the Chicago Symphony orchestra, composed some effective scores. The work of a young Minneapolis, Minn., composer, John Verrel, was performed by the Greek conductor, Metropoulos. Robert Palmer proved himself a serious composer of promise in his *Piano Sonata,* performed by John Kirkpatrick. The Ohio composer, Alvin Etler, continued to be heard from. Robert McBride continued to draw upon his natural sense of humour. In fact, the list of new names is a very long one and cannot be completely presented. One has the impression of great musical activity on the part of younger composers in 1940, in channels not entirely charted.

The Refugee Composers.—The influence of European composers and musicians newly arrived in the U.S. continued to be felt. To the names of Hindemith, Schoenberg, Stravinsky, Ernst Krenek and Ernst Toch already settled in the United States, must be added Darius Milhaud, Bela Bartok, Benjamin Britten, Karol Rathaus, Paul Dessau and Castelnuovo-Tedesco. These men influenced the musical culture of America in a very broad way. Orchestral concerts included their latest works. They influenced the music of the cinema and the radio. Several were in the employ of major universities and colleges. Both Schoenberg and Krenek addressed the Music Teachers' National Association. Several wrote in the English language concerning music. The theoretical ideas of Hindemith swept the eastern music schools in 1940. Important scores by these European composers and others not in the United States were heard in 1940. A *Symphony* by Darius Milhaud, commissioned by the Chicago Symphony orchestra, was given. A *Violin Concerto* by Hindemith was presented by the Boston Symphony orchestra. Several works by Prokofieff were heard: a *Cello Concerto,* the *Second Violin Concerto,* a *Sinfonietta* and the most popular and light *Peter and the Wolf. Quattro Vecchie Canzoni* by Malipiero was presented at the Coolidge festival in Washington. At the same concerts *Epithalamium,* a cantata by Pizzetti, and a *Sonata* for two violins and two pianos by Fitelberg were given. Bela Bartok's *Sonata* for two pianos and percussion instruments was performed. Chamber music by Rathaus, Stephan Wolpe and Nikolai Lopatnikoff were given. (R. L. Fy.)

Music, Popular.

The year 1940 will be remembered always as marking a definite break between the largest wholesaler and the largest retailer of popular music. The National Association of Broadcasters went on record as refusing to pay the licence fees asked by the American Society of Composers, Authors and Publishers (ASCAP), and at the close of the year most of the popular music and much of the serious music of the world went off the air.

Radio had decided by early spring to boycott all ASCAP copyrights after the conclusion of current contracts, and set up its own publishing company, Broadcast Music, Inc. (known as BMI), to compete with the output of most of the world's successful composers since 1884. After the failure of repeated attempts to bring the warring organizations into conference, the department of justice announced that actions would be instituted against the National Broadcasting company, Columbia Broadcasting system, National Association of Broadcasters, ASCAP and BMI. Whether this threat would bring the combatants together was one of the questions for 1941 to solve.

Several of the popular songs of BMI entered the Hit Parade, the most successful being "Practice Makes Perfect," by Ernest Gold, formerly employed by the Songmart, a recognized clearinghouse for amateur composers. Sheet music and record sales showed a solid list of ASCAP hits, and no BMI number came

ithin the "first fifteen," as given by *Variety*. According to this st, the biggest seller of the year was "South of the Border," hich had already established its popularity in 1939. Next came Oh, Johnny," repeating its success of 1917, largely through the nterpretation of Bonnie Baker. Third and fourth places were lled by the psychologically related songs, "Scatterbrain" and Careless."

Fifth in the list was "Indian Summer," a vocal version of the ictor Herbert instrumental classic of many years ago. Then ame "In an Old Dutch Garden," "When You Wish upon a Star" from Disney's "Pinocchio"), the "Woodpecker Song," "Playmates" and "Make Believe Island." Irving Berlin's "God Bless merica" (with all royalties going to the Boy and Girl Scouts) nished in eleventh place, followed by "I'll Never Smile Again." he final trio in the first fifteen were "Blueberry Hill," "Ferryoat Serenade" and "Only Forever."

With radio's ban on copyrighted music, arrangements of maerial in the public domain became distressingly common. By he end of the year, the jazzing of the classics and folk-music as in full swing, with Stephen Foster the chief sufferer.

Musical comedy flourished in 1940. Cole Porter had his quota f successes in *Panama Hattie;* Rodgers and Hart produced n excellent score for *Pal Joey;* Berlin did his bit for *Louisina Purchase* and Vernon Duke contributed some good music o *Cabin in the Sky*. Late in the year, Jerome Kern and Oscar Hammerstein came out with an individual surprise in "The Last Time I Saw Paris." In the purely instrumental field the youthful Morton Gould did notable work as creator, arranger and conductor. (*See* also MUSIC.) (S. SP.)

Mussolini, Benito (1883–), Italian statesman and dictator. For his earlier career, see *Encyclopædia Britannica,* vol. 16, pp. 28–31. His conference with Hitler at Brennero March 18, 1940 reaffirmed the axis ties and was a prelude to the events of the following months. Il Duce chose June 10 as the propitious date for entering the war, doing so with the declaration that "our conscience is entirely clear." After a few desultory thrusts at dying France he consulted with Hitler at Munich June 18 on the terms of peace. Italian military activities then remained in relative abeyance until the beginning of the Egyptian campaign on Sept. 12.

Two other important conferences with Hitler followed during 1940, one on Oct. 4 at Brenner pass and the second at Florence on Oct. 28, the day Italy began operations against Greece. Reverses in the latter campaign obliged him to shake up his military command Dec. 6 and accept the resignation of Marshal Badoglio (*q.v.*). In his first public speech after Italy's entry into the war, Mussolini declared on Nov. 18 that "we shall break Greece's back, whether in 2 or 12 months it little matters." (*See* also ITALY.)

Mustard Gas: *see* CHEMICAL WARFARE.
Mustard Seed: *see* SPICES.

Myers, Jerome (1867–1940), U.S. artist, was born in Petersburg, Va., March 20. He went to New York city at the age of 19 to study art at Cooper union and the Art Students' league.

He received a bronze medal from the St. Louis exposition for his paintings on exhibition and won several prizes from the National Academy of Design. His paintings are in museums in New York city, Chicago, Washington, Rochester, Milwaukee, Newark, Los Angeles and New Orleans. He was author of an autobiography, *An Artist in Manhattan,* published on his birthday in 1940. He died in New York city, June 19.

Nagel, Charles (1849–1940), U.S. secretary of commerce and labour under President Taft, was born in Colorado county, Texas, Aug. 9, the son of a physician. The family moved to St. Louis in 1864 where the son studied law at the St. Louis Law school and continued his studies in Berlin. On his return he was admitted to the bar and won distinction in his profession. He was a lecturer in the St. Louis Law school, served in the Missouri legislature and was a member of the Republican National committee for four years. He died in St. Louis, Jan. 5.

Narcotics: *see* DRUGS AND DRUG TRAFFIC.

National Academy of Sciences. The National Academy of Sciences was incorporated by act of congress in 1863 for the purpose of investigating, examining, experimenting and reporting upon any subject of science or art whenever called upon by any department of the United States government. Membership is by election, in recognition of outstanding achievements in scientific research, and is limited to 350 active members and 50 foreign associates. Members must be citizens of the United States.

New members are elected by the academy on nominations from its 11 sections: mathematics, astronomy, physics, engineering, chemistry, geology and palaeontology, botany, zoology and anatomy, physiology and biochemistry, pathology and bacteriology, and anthropology and psychology. The names considered by the sections in their nominating ballots originate from suggestions made by members; consequently, there are no applications for membership.

At the annual meeting held in Washington, D.C., April 22, 23 and 24, 1940, 15 new members were elected, as follows: Rollin Thomas Chamberlin, Carl Ferdinand Cori, George Washington Corner, Louis Frederick Fieser, Wendell Mitchell Latimer, Karl Friederich Meyer, James Bumgardner Murphy, Isidor Isaac Rabi, Stephen Walter Ranson, William Jacob Robbins, Richard Edwin Shope, William Hay Taliaferro, Stephen Timoshenko, Ernest Glen Wever, Claus Hugo Hermann Weyl. Four foreign associates were elected: Bernardo Alberto Houssay, James Peter Hill, Giuseppe Levi and Sir Henry Hallett Dale.

Three medals were presented at the dinner on April 23, 1940:—The Agassiz medal for Oceanography (gold), to Frank Rattray Lillie, past president of the Woods Hole Oceanographic institution, for his important contributions to the science of Oceanography; the Public Welfare medal (gold), to John Edgar Hoover, of the Federal Bureau of Investigation, for his application of scientific methods to the problem of crime prevention; and the Charles Doolittle Walcott medal (bronze) and accompanying honorarium, to A. H. Westergaard, of the Sveriges Geologiska Undersokning, Stockholm, Sweden, for his eminent researches on the stratigraphy and palaeontology of the Cambrian formations of Sweden.

The autumn meeting was held at the University of Pennsylvania, Philadelphia, Pa., on Oct. 28, 29 and 30, 1940.

The academy publishes an annual report, biographical memoirs of its deceased members, occasional scientific memoirs and monthly *Proceedings*.

The officers of the Academy are: Frank B. Jewett, president; Arthur L. Day, vice president; L. J. Henderson, foreign secretary; F. E. Wright, home secretary; J. C. Hunsaker, treasurer and Paul Brockett, executive secretary. The Academy building is at 2101 Constitution avenue, Washington, D.C. (P. BT.)

National Catholic Rural Life Conference: *see* CATHOLIC RURAL LIFE CONFERENCE, NATIONAL.

National Catholic Welfare Conference: *see* CATHOLIC WELFARE CONFERENCE, NATIONAL.

National Debts. The national debt of a country generally indicates the extent to which the central government has resorted to borrowing over the years to balance the deficit between its expenditures for all government services and investments and its revenues from taxation and various minor sources. While revenues in all countries have equalled or exceeded expenditures during many years in the past, the world-wide trend of national debts has been upward, particularly since 1914. This upward trend has been primarily a result of the tremendous expenditures required in modern war, though during the past decade public spending to relieve unemployment has also been of major importance in certain countries. It was only with the war of 1914–18 that the national debt of the United States rose to substantial size. Before the Civil War it never exceeded $100,000,000 and even that conflict increased the debt to only $2,678,000,000. In subsequent years more than half of the total was liquidated so that by 1916 the national debt was reduced to $1,225,000,000. From this low level the debt rose precipitously during the World War years and by 1919 reached a total of $25.482,000,000. Under the peaceful and prosperous conditions of the '20s liquidation again took place, an excess of revenues over expenditures at the rate of about $1,000,000,000 a year lowering the government's obligations to $16,185,000,000 by 1930.

Since the acute phase of the economic depression which began toward the end of 1929, however, government expenditures have constantly exceeded revenues, with a resulting steady increase in the national debt. At first this was merely a consequence of the depression as the sharp fall in the national income drastically curtailed government revenues. But in the course of the administration of Franklin D. Roosevelt the increase in the national debt became a positive aspect of economic policy designed to promote business recovery. For the first time in United States history heavy government expenditures were used as a remedy for business and economic depression. These increased expenditures were in part due to the assumption of a relief load (for the unemployed, agriculture and other groups) which could no longer be carried by state and local governments and in part to enlarged requirements for national defence. Over and above these however, were expenditures for public improvements and work programs, such as waterworks, sewage-disposal plants, power facilities, schools, libraries, recreation facilities and other projects. These projects were designed not only to serve the public need which their titles imply; they were conceived in total as a stimulus to the economy both by their direct contribution to the national income, and by their indirect effect upon consumption and private investment. The national debt rose from $23,815,000,000 at the end of 1933 to $41,961,000.000 at the end of 1939 largely because of the adoption of this controversial policy.

While this policy, a subject of considerable disagreement, has been popularly designated "pump-priming" and "government spending," it might, with equal appropriateness have been called "government debt creation" since, according to the theory on which it is based, the debt creation is as important as the spending. Obviously government spending could be increased by the raising of additional revenues from taxation, but this procedure would not meet the economic problem that the spending-through-borrowing policy was designed to attack. For insofar as the tax receipts came from funds which would have been spent for consumption goods or from savings which would have been spent for investment goods, there would be no added stimulus to economic activity. Only from such tax receipts as might be derived from savings which would have been hoarded could an increase in the national income be expected. Through debt creation financed by means of new bank credit, however, an increase in government spending might be achieved which need not directly reduce private spending.

It is seldom realized that under modern conditions the volume of n saving at high levels of the national income cannot be utilized witho increasing some of the various types of debt. Many individual savers pref to invest in the form of debt obligations rather than in equities and ma institutionalized savings are limited by law to investment in debt oblig tions. And, as is well known, the net saving of society must be invest if national income, business profits and employment are not to fall o During the decade of the '20s four major types of debt increased suf ciently to maintain a high level of employment despite the considerab liquidation of the national debt: (1) Private business debt; (2) co sumers' debt; (3) state and local government debt; and (4) foreign de (investments abroad).

Why these types of debt failed to expand sufficiently to create fu employment during the decade of the '30s is still a matter of sharp co troversy. However, such was the case. In fact, all except consumer de actually declined from 1933 to 1939. In their stead the Roosevelt admi istration used continuous increases in the national debt to stimulate en ployment and general economic activity.

Although this policy was still a major factor in the rise of the nation debt in 1940, the situation was fundamentally changed by the vast defen program initiated around the middle of the year. Defence appropriatio and authorizations enacted by the congress from June 1940 and oth recommendations of the president, including those contained in the budg for the fiscal year 1942, made the total defence program $28,480,000,00 Such a huge program undoubtedly opened a new chapter in the history the national debt.

Defence expenditures were increased rapidly after the inauguration the new program, contributing to the continued rise of the national de in 1940. By the end of the year the debt reached $45,024,631,000, despi various new taxes enacted by the congress, thus just exceeding the o statutory limit of $45,000,000,000. Provision had been made in the fir Revenue act of 1940, however, for a $4,000,000,000 increase in the de limit.

Table I.—*Gross Debt of the United States, 1913–42*

June 30	(Millions of dollars)	June 30	(Millions of dollars)
1913	1,193	1928	17,604
1914	1,188	1929	16,931
1915	1,191	1930	16,185
1916	1,225	1931	16,801
1917	2,976	1932	19,487
1918	12,244	1933	22,539
1919	25,482	1934	27,053
1920	24,298	1935	28,701
1921	23,976	1936	33,545
1922	22,964	1937	36,427
1923	22,350	1938	37,167
1924	21,251	1939	40,445
1925	20,516	1940	42,971
1926	19,643	1941E	49,157E
1927	18,510	1942E	58,367E

Source: Data from 1913 to 1940 are from U.S. Treasury Department, daily treasury stat ment (revised); 1941 and 1942 are estimates reported in budget of the Unit States government for the fiscal year ending June 30, 1942 as presented to t congress by President Roosevelt.

By the end of 1940 it was evident that the contemplated increase in th defence effort had made the new statutory debt limit inadequate. Secretar of the Treasury Morgenthau suggested that the debt limit be raised $65,000,000,000 and, in his annual budget message, President Rooseve questioned the significance of any statutory debt limit, except as it serv as a fiscal monitor. Since the president stated as his opinion that it wa necessary to finance a substantial part of the defence program throug borrowing it appeared likely that the national debt would continue to ri markedly for the duration of the war period. In the 1941 budget messa of President Roosevelt, the deficit for the fiscal year 1942 was estimate at over $9,000,000,000, despite expectations of greatly increased revenu from existing taxation. It is interesting to note that the president reiterate the fiscal ideas upon which his administration was based by stating tha such drastic taxation as would be required to finance the defence progra on a pay-as-you-go basis would interfere with the full use of our productiv resources.

In other words, he felt that the stimulus of government debt creatio was necessary for the establishment of relatively full employment.

The question in many minds, however, was whether the already larg total of the national debt and the further increase which seemed likel might not lead to inflation. On this question it can be stated that th absolute size of existing debts, public or private, cannot produce inflatio Inflation results when the total flow of expenditures, public plus privat is larger than can be met by current production at current prices. Whe unused resources are available, an increase in expenditures will result i increased production and not in inflation, except insofar as this might b prevented by shortages of specific commodities or speculative price rises.

The relation of inflation to an increase in debt arises from the fact th the flow of expenditures can be increased through an increase of bank credi either by government or by private borrowing. If this occurs after fu employment is reached, it must necessarily result in an inflationary ris of prices and costs. Borrowing can take place and even increase witho causing inflation, however, provided that it derives from increased savin and not from increased bank credit. For in the latter case total spendin is not increased, purchasing power being merely transferred from the save to the borrower (government or private).

Table II.—*National Debt of Various Countries*

Country	Date of Latest Comparable Debt Figures	Total Debt in Local Currency (000,000)
rica		
Egypt	4/30/39	95.0 pounds
Union of South Africa	3/31/40	289.6 pounds
nerica, North		
Canada	3/31/39	3,642.0 dollars
Mexico	12/31/36	1,326.0 pesos
United States	6/30/40	42,967.0 dollars
nerica, South		
Argentina	12/31/38	4,398.6 pesos
Brazil	12/31/37	16,841.2 milreis
Chile	12/31/39	3,980.1 pesos
Colombia	12/31/38	206.6 pesos
Peru	6/30/39	807.5 soles
ia		
India	3/31/40	11,956.7 rupees
Japan	3/31/40	22,886.0 yen
rope		
Belgium	12/31/39	59,318.3 francs
Bulgaria	12/31/39	28,864.0 leva
Czechoslovakia	12/31/38	52,950.0 koruny
Denmark	3/31/39	1,237.7 kroner
Finland	12/31/38	3,554.0 markkas
France	8/31/39	352,210.0 francs
Germany	6/30/40	56,426.0 reichsmarks
Greece	1/31/40	52,874.7 drachmas
Hungary	6/30/38	1,597.7 pengos
Italy	9/30/35	108,636.6 lire
Netherlands	6/30/39	3,911.9 guilders
Norway	6/30/39	1,528.4 kroner
Poland	9/30/38	4,973.2 zlotys
Portugal	12/31/38	7,192.1 escudos
Rumania	3/31/38	117,874.3 lei
Spain	12/31/35	21,779.0 pesetas
Sweden	6/30/40	3,625.0 kroner
Switzerland	12/31/39	2,725.1 francs
Turkey	5/31/39	619.4 pounds
United Kingdom	3/31/40	8,931.4 pounds
Yugoslavia	3/31/39	24,620.0 dinars
eania		
Australia	12/31/39	1,317.5 pounds
New Zealand	3/31/39	304.0 pounds

ces: Statistical Year-Book of the League of Nations, 1939–40, Geneva, 1940. Federal Reserve Bulletin; Official Government Reports. Latest end of fiscal year data available.

nce 1940 was a year of war on three continents and of heavy armament nditure throughout the world, there is no doubt that the national debts ll major countries were increased by substantial amounts. Reliable res for most countries, however, were not available. For in addition he usual difficulty that reports are only made at the end of the fiscal , the totalitarian powers suppressed, either entirely or in part, ination on their fiscal operations.

urthermore, little was known about government financial conditions he conquered nations of Europe.

he national debt figures which were issued for a few major countries however, indicate what occurred because of war conditions. The debt Great Britain rose from £8,475,000,000 on Sept. 30, 1939 to £10,106,-000 on Sept. 30, 1940, an increase equivalent to $6,524,000,000 for period covering approximately the first year of war.

n Canada the national debt rose from $3,642,049,000 on March 31, 9 to $4,028,573,000 a year later and the rate of increase is believed ave been accelerated since the more active phase of the war began in 1940. An increase in the publicly revealed debt of Germany from 39,748,900,000 on Sept. 30, 1939 to r.m. 76,980,000,000 on Nov. 30, o was made known, but these figures are of limited meaning (except in-r as they suggest the extent of the German war effort), because they do represent the total government debt at either date.

n Table II are presented the national debts of various countries for the of the latest fiscal year available. It should be kept in mind that these figures are not comparable with each other because of differences in division of responsibility between the national and local government s from country to country, because of differences in size, wealth and ulation, and because of differences in services rendered or investments le by government. Moreover, in these days of controlled exchange and e the conversion of local currencies into a common unit, such as the ar, is exceedingly difficult. (*See* also Budgets, National; Great tain and Northern Ireland, United Kingdom of; National In-e.) (M. Gt.)

tional Defence: *see* Defence, National.

tional Education Association of the United States, organized in Philaphia in 1857, "is dedicated to the upbuilding of democratic ilization and supported by the loyal co-operation of the teach- of the United States to advance the interests of the teaching fession, promote the welfare of children and foster the edu-ion of all the people."

t has a membership of over 200,000 and is governed by a rep-entative assembly composed of delegates from state, territorial l local units. Its official organ is *The Journal* of the NEA issued to all members monthly except during June, July and August.

The association's winter convention was held in St. Louis, Mo., Feb. 24–29, 1940; its general convention in Milwaukee, Wis., June 30–July 4, 1940. The 1941 conventions are to be at Atlantic City, N. J., in February and Boston, Mass., in July. Leading activities of the association during 1940 were the activities of the Educational Policies commission, appointed by the NEA and the American Association of School Administrators to define guiding policies in American education; the continuing campaign on behalf of teacher welfare and federal aid for elementary schools and high schools; and the development of Future Teachers of America for high school and college students. American Education Week, sponsored by the association and allied groups for the 20th year on Nov. 10–16, 1940, was built around the theme "Education for the Common Defence." This observance brought millions of visitors into the schools.

Association headquarters are in its own building at 1201 16th Street Northwest, Washington, D.C.; president for 1940–41, Donald DuShane, superintendent of schools, Columbus, Ind.; executive secretary, Willard E. Givens. (*See* also Academic Freedom; Education.) (J. E. Mo.)

National Finance: *see* Banking; Budgets, National; Gold Reserves and Gold Standard; Income Tax; National Debts; National Income; Wealth and Income, Distribution of.

National Gallery of Art: *see* Smithsonian Institution.

National Geographic Society. Organized in 1888 "for the increase and diffusion of geographic knowledge," and since 1899 directed by Gilbert Grosvenor, the National Geographic society has completed over a half-century of noteworthy achievement. It had in 1940 a membership of 1,100,000 in all parts of the world—the largest educational institution of our time. In addition to the editorial and photographic surveys constantly being made, the society has sponsored more than 100 scientific expeditions, some of which required years of field work to achieve their objectives. Narratives of these expeditions and other explorations, together with photographic surveys, are presented to the society's membership through the pages of the *National Geographic Magazine*. To form a pictorial record of world geography, the society has assembled a gallery of some 300,000 photographs, over 25,000 of which are in natural colour.

During 1939 the society in co-operation with the Smithsonian institution sent an archaeological expedition to Veracruz, Mexico. M. W. Stirling, leader of the party, reported on Jan. 16, 1939, the discovery of the oldest dated work of man yet uncovered in the Americas, a Mayan stele bearing a date equivalent to Nov. 4, 291 B.C. A second expedition sent to the same general region in 1940 uncovered five colossal heads and numerous other monuments of vanished Americans. Mr. Stirling's account of the new finds was published in the Sept. 1940 issue of the *National Geographic Magazine*.

Over 175 fossil specimens, including a rhinoceros skull 28 in. long and the skull of an 8-foot-long pig, were obtained by the National Geographic Society-South Dakota School of Mines palaeontological expedition, which spent three months in the Bad Lands of South Dakota in the summer of 1940. Dr. Joseph P. Connolly, president, and James D. Bump, museum curator, of the School of Mines, led the expedition.

Cloudy weather made it possible for the National Geographic Society-National Bureau of Standards expedition to obtain only a partial record of the total eclipse of the sun on Oct. 1, 1940. Eight tons of equipment were set up under the supervision of Dr.

Irvine C. Gardner at Patos, Brazil. Photographs were mad the inner corona, of the flash spectrum and of the four time apparent contact of the sun and moon. Tests with radio sig to determine the behaviour, during eclipses, of the ionized la in the upper atmosphere (the so-called "radio-reflecting laye were successfully completed.

Another aspect of science was studied by the society whe co-operated with the Oceanographic institution of Woods H Mass., in an investigation of ocean basins. Dr. Maurice Ew Lehigh university, was the leader of the expedition. Satisfac progress was reported by Dr. G. W. Gartlein, director of National Geographic Society-Cornell university three-year st of aurorae.

In addition to its magazine the society has published a se of nature books. The most recent is *The Book of Fishes,* ed by Dr. John Oliver La Gorce, the most comprehensive, full-co presentation yet published of the better known species of N American inland and coastal waters. The two-volume *Boo Birds,* edited by Dr. Gilbert Grosvenor and Dr. Alexander W more, in this series is the first book to be published portrayin full-colour illustrations all the known species of birds on North American continent, north of Mexico. The scientific m graph entitled "An Initial Series from Tres Zapotes, Vera Mexico," was published in 1940 as one of the society's serie *Contributed Technical Papers.* (G. Gr

National Guard. The development of the national gu one of the three main components of army of the United States, was greatly accelerated during year 1940. As the year began, the national guard, which then units in every state, territory of Hawaii, Puerto Rico and in District of Columbia, had just completed an augmentation aut ized in the president's executive order of Sept. 8, 1939, of 43 officers, warrant officers and enlisted men. At that time, too, national guard was in the midst of extra training activities aut ized by the same executive order. By the middle of the year strength of the national guard reached 14,561 officers, 214 rant officers and 226,837 enlisted men. For the first time national guard units were allotted to the territory of Alaska were in the process of organization.

The latter half of 1940, however, saw an even greater incr in the strength and training activities of the national gu During August most of its units participated for 21 days in large army manoeuvres held in different parts of the Un States. A strength of approximately 210,000 underwent training. Over 30,000 not participating in the large manoeu received the same length of training in their state areas.

Legislation passed by congress and approved by the presi on Aug. 27 authorized the president to order any or all mem and units of any or all reserve components of the army of United States, including the national guard, into the fe service for active duty in the army of the United States f period of 12 consecutive months each. The first units bro into active federal service under this law were inducted on S 16. At this time the strength of the national guard rea 15,828 officers, 214 warrant officers, 243,386 enlisted men, m ing a total of 259,428. Four infantry divisions of a total o such divisions in the national guard and many other units inducted on this date. Another large fraction was inducte October, still other units in November and it was expected by early in the year 1941 the entire national guard woul undergoing its year of intensive training.

THE NATIONAL GUARDSMEN of New York's 244th coast artillery reg were among the first called up for a year's duty in Sept. 1940

he areas of training for the national guard during this period e prepared generally in the southern part of the United States ough use was made of adequate state camps and some large ılar army posts in the north and northwest. Most coast de- e units underwent their training at the nearest harbour de- es. Adequate housing and training facilities were prepared ll training areas.

hese activities toward a proper national defence were by far most intense and extensive that national guard units have undergone in time of peace. The legislation authorizing training stated that the units inducted were for service in the limits of the western hemisphere, except for active which might be required in any of the territories and pos- ions of the United States, including the Philippine islands.

s the year closed, the war department was engaged in formu- g plans to cover the status and training of the national guard r the period covered by the legislation referred to above.

(J. H. Ws.)

ional Income. The most significant measure of the income of a nation generally is held to he net output of all of the nation's producing enterprises. magnitude of this national net production—national income important because the creation of commodities and services he basic objective underlying all economic activities. As national net product expands or contracts over a period of , the nation has a larger or smaller supply of goods avail- for either current or future consumption.

ational income, or the net value of commodities and services uced by all of the nation's business enterprises, aggregated it $73,700,000,000 in the United States in 1940. This amount eded the value for 1939 by $4,300,000,000, an improvement nore than 6%. The 1940 total also was higher than in any r year since 1929.

dustrial Origin of National Income.—Since producing s nearly always are specialized, and therefore perform only a of the whole process of creating a given commodity or serv- a summation of the total values of product for all producing s would contain a large element of duplication. The total e of electric power, for instance, includes a large valuation coal consumed in the process of producing the power, and, in y other cases as well, the product of one industry is largely w material utilized in other industries.

is possible, however, to determine the net production of given business enterprise. This net production is the total uct of the unit less all commodities (including capital equip- t) and services of other enterprises that are consumed in the se of operations. By summation of net production figures so ved for each unit in a specified industry, the net product utput of that industry may be obtained, and a further sum- on embracing all other industries similarly provides a na- al income aggregate. An analysis of the industrial origin of onal income is presented in Table I.

ational income advanced by more than $34,000,000,000 from depression low in 1932 to the recovery high in 1940. More one-half of this increase took the form of higher net product es in agriculture, mining, manufacturing and contract con- ction, although these industries taken together accounted only one-quarter of the national net product in 1932. The other stries provided distribution and other services which are ively better sustained in periods of declining business ac- y but which also do not expand rapidly as business in gen- demonstrates a cyclical recovery.

xcept in the year of lowest production, manufacturing in- ries supplied the largest segment of the national net product in the years here covered. Government is another important contributor, and was one of increasing importance during these years because of the great expansion in the volume of government services.

Table I.—*Industrial Origin of U.S. National Income*
(In 000,000,000's of Dollars)

Industry	1929	1932	1937	1939	1940†
Total National Income	$82.9	$40.1	$71.0	$69.4	$73.7
Agriculture	7.3	2.6	6.4	5.6	6.0
Mining	1.9	.5	1.5	1.2	1.4
Manufacturing	20.4	6.0	17.0	15.5	17.5
Contract Construction	3.7	.9	1.9	2.1	2.2
Transportation	7.1	3.6	5.1	4.8	5.1
Trade	11.3	5.3	9.1	9.1	9.4
Power and Gas	1.4	1.1	1.4	1.4	1.5
Communications	1.0	.7	.8	.9	.9
Finance	8.9	4.9	6.2	6.0	6.1
Government	6.3	6.5	9.0	9.9	10.2
Service	9.6	5.6	8.5	8.4	8.7
Not Allocated	4.0	2.4	4.1	4.5	4.7

Source: U.S. Department of Commerce. †Preliminary.

Distributive Shares of National Income.—National income may also be conceived as a pool of commodities and services the value of which is apportioned among the persons who supply the labour and capital utilized in creating this national net product. Because the national economic organization is established on a monetary basis, most of this assignment of the national income value takes the form of actual transfers of money. Not all transfers are made directly to individuals, and actual transfers to owners of capital may be either larger or smaller than the net production attributable to capital, but all of the national net output, or equivalent values, must either be transferred or credited to individuals. Table II presents an analysis of national income in terms of the shares distributive out of this national net product to the different groups contributing to net output value.

Changes in the magnitude of the several shares in different phases of the business cycle are conditioned largely by the character of the claims against the national net product exercised by labour and by the different types of capital.

Salaries and wages are relatively less variable than some of the other shares. They are related closely to net product plus depreciation and depletion. Since depreciation and depletion charges are offsets against gross commodities and services created currently, equivalent to the estimated value of capital goods consumed during the year but produced in prior periods, employment of labour is required in the production of commodities and services equal in value to the depreciation and depletion allowances as well as in the creation of net product itself. Such charges are quite stable relative to year-to-year changes in the national income aggregates and therefore provide support for salaries and wages in years of lower business activity.

Interest charges are relatively fixed and do not vary significantly with short-term changes in the value of current net output.

Table II.—*Distributive Shares of U.S. National Income**
(In 000,000,000's of Dollars)

Shares	1929	1932	1937	1939	1940†
Total National Income	$82.9	$40.1	$71.0	$69.4	$73.7
Total Compensation of Employees	52.8	31.5	47.4	46.8	49.4
Salaries and Wages	52.4	30.9	44.2	43.1	45.9
Supplements to Salaries and Wages	.4	.6	3.2	3.7	3.5
Net Income of Corporations	7.2	−3.6	4.0	3.8	4.8
Net Dividends	5.9	2.7	4.8	4.1	4.7
Corporate Savings	1.3	−6.3	− .8	− .3	.1
Net Income of Unincorporated Businesses	13.6	5.3	12.5	11.9	12.5
Entrepreneurial Withdrawals	12.6	8.1	10.8	10.8	11.2
Savings of Unincorporated Businesses	1.0	−2.8	1.7	1.1	1.3
Net Interest	5.9	5.7	5.0	4.9	4.9
Net Rents and Royalties	3.4	1.2	2.1	2.0	2.1

*U.S. Department of Commerce data; method of presentation is the author's.
†Preliminary.

Net income of corporations, a share that accrues to risk-capital and is in part distributed in the form of dividends, fluctuates widely. It is relatively high in prosperous years and low, or even negative, when business activity is unsatisfactory. Net income of unincorporated businesses includes a very large labour income element in addition to return on risk-capital because self-employed persons contribute both their personal services and their capital in the conduct of their businesses, and this share consequently does not fluctuate as widely as the net income of corporations. Net rents and royalties shift markedly as relatively rigid costs of property ownership, such as interest charges and taxes, impinge upon variable gross rents.

Values and Quantities.—The summation of value figures is the only practicable means of combining the production of such divergent things as refrigerators and government services, aeroplane travel and silk stockings, services performed by religious organizations and by life insurance companies, and all of the thousands of other items which must be taken into account in determining the national net output. Previous discussion has been confined to value figures for this reason.

The quantity of net production is, however, more significant for some purposes than the value of net production. Since v always is the product of price and quantity, the investig may approximate changes in the net quantity output by stud the value figures in conjunction with indexes of prices, and a "deflation" of net value of product aggregates yields fig indicative of the year-to-year changes in net quantity produc or real national income. The 6% advance in the value of net duction from 1939 to 1940, for instance, occurred during a pe when prices were advancing only moderately, and nearly all o improvement in national income represented a greater net q tity output of commodities and services in the second year.

No existing price series or combination of series are sufficiently prehensive to permit an exact conversion of national income values quantity net production basis, but approximate results may be obt by references to indexes like those given in Table III. Quantity o appears to have declined by about one-quarter from 1929 to 1932 about the same in 1937 and 1939 as in 1929, and was highest of any in 1940. It is entirely likely, in fact, that quantity production in exceeded 1929 by a volume about great enough to compensate fo 8% growth in population over the intervening period and that real nat income per person was about equal in 1929 and 1940.

Important Elements Controlling the Magnitude of National Inco The aggregate of national income is controlled largely by four very impo factors: the level of prices, the quantity and quality of labour, the qua and character of capital and the nature of the national socio-econ organization. As between different periods in the same country, an between different countries at the same time, at least the attainable of national income is determined very largely by these factors. recognition of their importance was especially significant in the U States in 1940 because a large-scale national defence program had effected primarily either by application of unutilized man-power and ca or by those factors plus some sacrifice in current consumption.

Of these factors, differences traceable to differences in prices are what fictitious in character, since measures of national income are principally as indicators of the net quantities of commodities and ser available for current or future consumption. Population changes, incl changes in the labour force, usually occur only slowly, although they be accentuated by immigration. Similarly, capital accumulation, rel to existing stocks of capital goods, is not a rapid process normally, alth it may be accentuated sharply by concerted national action, usually the stimulus of political emergency and the guidance of strong ce authority. Socio-economic changes, which usually occur only over a period of time but also may be stimulated by rapidly changing bus conditions, can be of such a nature that tasks performed in the home the individual for himself are taken over by business enterprise, or versa, and such changes necessarily have an effect upon a measure o net production by business enterprises.

National Income, 1900–40.—According to the estimates shown in IV, national income in the United States has expanded markedly in last 40 years.

The influences of price and population changes have been important ing this period. Compared with present-day levels, prices were low the early 1900s, much higher in 1917–20 and somewhat higher in 192 Population has increased from 76,129,000 persons in 1900 to 131,66 in 1940, and, further, an increasing proportion of the total population fallen within the age ranges of greater productivity. Improving produ techniques and a fairly continuous process of productive asset accumul also were important, and it is likely that the performance of many ser formerly rendered at home was taken over by business enterprises d this period. (*See* also BUDGETS, NATIONAL; GREAT BRITAIN AND NORTH IRELAND, UNITED KINGDOM OF; WEALTH AND INCOME, DISTRIBUTION

(J. L. M

Table III.—*Indexes of U.S. National Income and Prices*
(1929=100)

Year	National Income*	Cost of Living†	Wholesale Prices†	Year	National Income*	Cost of Living†	Wholesale Prices†
1929	100.0	100.0	100.0	1935	67.4	80.0	83.9
1930	83.1	97.4	90.7	1936	78.3	80.8	84.8
1931	65.5	88.7	76.6	1937	85.7	83.8	90.6
1932	48.3	79.6	68.0	1938	76.7	82.2	82.5
1933	51.2	75.4	69.1	1939	83.7	81.1	80.9
1934	60.7	78.1	78.6	1940‡	88.9	82.5	82.3

*U.S. Department of Commerce. †Bureau of Labor Statistics, U.S. Department of Labor. ‡Preliminary.

Table IV.—*Estimates of National Income of the U.S.**
(In 000,000,000's of Dollars)

1900—$17.9	1915—$37.2	1922—$60.1	1929—$82.9	1936—$64.9
1909— 29.1	1916— 47.4	1923— 69.7	1930— 68.9	1937— 71.0
1910— 30.7	1917— 54.5	1924— 69.6	1931— 54.3	1938— 63.5
1911— 30.3	1918— 59.7	1925— 74.4	1932— 40.1	1939— 69.4
1912— 33.1	1919— 67.3	1926— 76.5	1933— 42.4	1940— 73.7†
1913— 35.0	1920— 69.3	1927— 75.8	1934— 50.3	
1914— 34.4	1921— 52.3	1928— 79.6	1935— 55.9	

*U.S. Department of Commerce. †Preliminary.

Table V.—*National Income (yearly average) in Selected Countries*
(In 000,000,000's of Dollars)

Country	Period Covered	National Income*	National Income Adjusted for Differences in Prices: Income in "International Units"	Adjusted National Income per Head of Occupied Population†
United States	1925–34	$66.2	$66.2	$1,381
Canada	1925–34	4.49	5.08	1,337
New Zealand	1925–34	.83	.69	1,202
Great Britain	1925–34	20.4	21.9	1,069
Australia	1925–34	3.20	2.54	980
South Africa	1923	.96	.77	276
Switzerland	1925–34	1.79	1.92	1,018
Eire	1925–34	1.80	.83	705
Sweden	1925–34	1.88	1.73	653
Greece	24, 29, 34	.49	.92	397
Finland	1925–34	.44	.47	380
Hungary	1925–34	1.08	1.20	359
Yugoslavia	1925–34	1.50	1.35	330
Bulgaria	1925–34	.35	.52	284
Rumania	1925–34	.97	1.47	243
Netherlands	1925–34	2.06	2.62	855
France	1925–34	8.79	12.5	684
Denmark	1925–34	1.05	1.01	680
Belgium	1925–34	1.42	2.03	609
Norway	1925–34	.73	.61	539
Czechoslovakia	1925–27	2.12	2.82	455
Poland	1925–34	2.75	3.43	352
Germany	1925–34	15.2	17.6	646
Austria	1925–34	1.04	1.61	572
Italy	1928, 31	4.77	5.32	343
Latvia	1925–34	.20	.25	345
U.S.S.R.	1925–34‡	14.9	16.5	285
Estonia	1925–34	.11§	.14	341
Lithuania	1925–34	.16	.19	207
Japan	1925–34	..	..	353

*Concept differs slightly from one implicit in figures given in prior sections.
†In dollars; population as enumerated or estimated for 1930. ‡Average of 1928 and 1934. §1928.

National Insurance: *see* SOCIAL SECURITY.

National Labor Relations Board: *see* LABOUR UNI LAW (CASE): *Labour;* SUPREME COURT OF THE UNITED STA *Labour;* UNITED STATES: *The NLRB.*

National Monuments: *see* NATIONAL PARKS AND M MENTS.

National Museum: *see* SMITHSONIAN INSTITUTION.

National Parks and Monuments.

In little more two-thirds of a tury, a system of national parks, national monuments and a recreational areas undreamed of a century ago in any poli economy, has been established and developed in the United St The Yellowstone, the first national park, was established in M 1872. On Dec. 31, 1940, there were 162 separate areas in federal park system of the United States, with a total are approximately 21,552,000 acres. Twenty-six of these areas national parks, areas reserved by congress because of their su lative scenery or some historic or scientific feature of outst ing national interest. Eighty-two are national monuments, a

ılly established by presidential proclamation under authority he congress because of historic, prehistoric, or scientific inter- of national calibre.

ı addition there are four national historical parks, 11 national tary parks, seven battlefield sites, nine national memorials of ous types, six national historic sites, one national recreational ., 12 national military cemeteries, three national parkways, and park system of the national capital, consisting of over 700 rate units in and around Washington, D.C.

'uring 1940 two of the nation's outstanding scenic regions— gs canyon (California) and Isle Royale (Michigan)—were ıded in the federal park system. Kings canyon national park, ıst scenic wilderness of High Sierra peaks, numerous alpine s and groves of giant sequoias, was established March 4, 1940. hin its boundaries is the former General Grant national park, gnated as the "General Grant Grove section"; also picturesque wood mountain, with its fine stands of sequoias, included by idential proclamation of June 21, 1940. Isle Royale, a na- al park project since March 3, 1931, attained full national : status on April 3, 1940. Located in upper Lake Superior, niles northwest of Keewenaw point, Mich., and 20 miles south- of Thunder cape on the Canadian mainland, this park in- es, in addition to rugged Isle Royale, a number of nearby s and protruding rocks. Splendid hardwood and coniferous sts, numerous lakes and picturesque shores are features of roadless wilderness.

her areas included in the federal park system during 1940 are: Whit- national monument, Washington, site of an Indian mission and school lished in 1836 by Dr. and Mrs. Marcus Whitman; Appomattox Court se national historical monument, Virginia, scene of the surrender of the ederate army under General Lee to the Federal army under General ıt, April 9, 1865; Manassas battlefield national historic site, Virginia, e of the battles of First and Second Manassas fought July 21, 1861 and 29–30, 1862; Vanderbilt mansion national historic site, Dutchess county, York, a fine example of the type of estate built by captains of industry ıe era of expansion that succeeded the War Between the States; and er battlefield national cemetery, Montana, site of the battle of the e Big Horn river in which Lieutenant Colonel George A. Custer and command of 264 officers and men were destroyed by Sioux Indians. cellent progress was made during 1940 on the construction of the mi.-long Blue Ridge parkway, which, when completed, will connect inia's Shenandoah national park with the Great Smoky mountains nal park in North Carolina and Tennessee. Sections of this parkway ling approximately 200 mi. have been completed and opened to travel. ly 50 mi. of the 455-mi.-long Natchez Trace parkway, which will link ıville, Tenn. and Natchez, Miss. following to a great extent the Old hez Trace, historic Indian trail, have also been constructed.

sitors to the various units of the federal park system (exclusive of the nal capital parks and completed sections of the national parkways) ıg the travel year ended Sept. 30, 1940, totalled nearly 16,750,000, a ter number than in any previous travel year. An estimated 10,000 ons visited Great Smoky mountains national park on Labor Day, Sept. nd witnessed the dedication of that area by President Franklin D. sevelt. (N. B. D.)

tional Socialist Party: *see* FASCISM.

tional Television Systems Committee: *see* TELE- ON.

tional Wealth: *see* WEALTH AND INCOME, DISTRIBUTION OF.

tional Youth Administration: *see* EDUCATION; EDUCA- N, VOCATIONAL; GOVERNMENT DEPARTMENTS AND BUREAUS; IVERSITIES AND COLLEGES.

tural Gas. In 1939 production in the United States de- clined 6% to 2,437,200,000,000 cu.ft. of which % was used in the field, 52% for industrial, 16% for domestic 5% for commercial consumption. The largest item of indus- l use is the production of carbon black, which took 14% of total output.

roduction in Canada increased 6% in 1939, to 35,400,000,000 t. and preliminary figures indicate a further increase in 1940. (G. A. Ro.)

uru: *see* MANDATES; PACIFIC ISLANDS, MANDATED.

val Bases, U.S.: *see* DEFENCE, NATIONAL; HISPANIC

THE GREAT SMOKY MOUNTAINS national park in North Carolina and Tennessee was dedicated Sept. 2, 1940, by President Roosevelt

AMERICA AND THE EUROPEAN WAR; NEUTRALITY; WEST INDIES, BRITISH.

Navarro, Mary Anderson de: *see* ANDERSON, MARY.

Navicert System: *see* BLOCKADE; SHIPPING, MERCHANT MARINE.

Navies of the World. Though in some countries the effect of the European war which broke out on Sept. 3, 1939, has been to hold up or slow down the construction of new warships, in others the result has been the opposite. Especially has the latter been the case in the United States.

By Nov. 1940, there were no fewer than 42 battleships building or about to be begun, of which 7 were British, 17 U.S.A., 9 Japanese, 1 French, 2 Italian, 3 German and 3 Russian. In the cases of 4 British, 11 U.S.A., 5 Japanese and possibly 2 German, the displacement is between 40,000 and 50,000 tons. Of the remainder, all except four Japanese were to be of 35,000 tons, in accordance with the original limitation imposed by the London Naval treaty of 1936, which was expanded by agreement in 1938 to 45,000 tons, and by 1940 abandoned altogether. The four Japanese ships just mentioned were believed to be of about 15,000 tons, an enlargement of the German "pocket battleship" design. Three of them were reported to have been launched during 1939–40.

None of the various designs provided for a speed of less than 28 knots, and in the majority of instances the figure exceeded 30 knots. Other features common to all were absence of torpedo tubes, extensive protection against plunging fire or air bombing, an ample anti-aircraft armament, and the inclusion of seaplanes and catapults in the equipment. General similarity was inevitable in ships of equal displacement, affording little latitude for innovations if adequate defensive power, protection, speed and seakeeping qualities were to be ensured. But considerable variation existed in 1940 as regards the calibre of the main armament. British 35,000-ton battleships were to be armed with ten 14-in. guns, and the 40,000 tonners with 16-in. U.S.A., Japanese and Russian battleships of 35,000 tons or over were all built to mount nine 16-in., while the French, German and Italians preferred either eight or nine 15-in. In range and accuracy there was believed to be little to choose between the three calibres, the main differences being the weight of the gun and its mounting, and of the

projectile that it fires. The Japanese 15,000-ton ships were reported to be armed with six 12-in. guns.

With the exception of Italy, whose naval staff regards such vessels as superfluous in view of the country's geographical position, all the above powers were building aircraft carriers, varying in displacement from 14,000 to 26,000 tons. A typical example of the most modern type of aircraft carrier is the British "Ark Royal" of 22,000 tons, which was completed in 1938. She has a speed of 31 knots, and is armed with 16 dual-purpose guns of 4·5-in. calibre. She can operate 60 aircraft, though her spacious hangars, arranged on two decks, could undoubtedly accommodate many more than these.

Cruisers have hitherto been limited by treaty to a displacement of 8,000 tons, and a maximum gun calibre of 6·1-in., but this does not apply any longer. The United States had in hand in 1940 a number of cruisers of from 10,000 to 13,000 tons, and other nations will doubtless follow suit. Though Japan was not a party to the 1936 treaty, there was no evidence in 1940 that she had laid down any cruiser of more than 8,000 tons.

Destroyers built in recent years are remarkable for their size, many of those recently built for the British fleet being of over 1,900 tons displacement, while the United States has ordered some of 2,100 tons. Japan has over a dozen of about 2,000 tons, and France's largest are of 2,884 tons. Italy has not yet gone beyond 1,729 tons, but was building a dozen cruisers of 3,362 tons, obviously designed to deal with destroyers. Germany's biggest destroyers were believed to be of 1,870 tons, but Russia completed several of about 2,900 tons.

All over the world in 1940 submarines were being built in large numbers. In the United States navy, under-water craft building or on order at the end of 1940 totalled no fewer than 80. Japan had about a dozen under construction, Italy 16, and Germany an uncertain but undoubtedly considerable number. France was to have built 25 of various types, but because of the defeat of 1940 few of these seemed likely to materialize, at any rate under the tricolour. Russia, which is believed to possess more submarines than any other nation, published no figures, but 20 was probably a conservative estimate of the number in hand.

British Naval Strength.—Of the new battleships which were under construction when war with Germany began in 1939, two were believed to have been completed in 1940. Equal progress was probably made with other categories of new warships.

Navies of the World as of Dec. 31, 1940

Country	Battleships & Battle Cruisers	Coast Defence Ships	Cruisers	Aircraft Carriers	Destroyers	Torpedo Boats	Submarines	Sloops, Etc.
British Empire	16	3	68	8	230	40	45	55
U.S.A.	15		37	6	162	9	104	10
Japan*	10	5	37	7	103	12	62	2
France	7	2	18	1	53	17	74	9
Italy	6		20	..	53	135	96	1
Germany*	5	2	6	1	19	80	100	2
Russia*	3		5	1	40	158	170	..
Turkey	1		2	.	4	3	9	2
Greece			1		10	15	6	..
Spain	.	.	6	.	16	6	6	4
Sweden	.	8	2		10	21	16	..
Neth'l'nds		1	5	.	8	10	21	3
Norway		2	..	..	..	16	6	..
Denmark		2	.	.	..	17	12	..
Finland		2	.	.	..	7	5	..
Poland	.	.	.	.	2	..	4	2
Estonia†	..	.	.	.	..	1	2	..
Latvia†	.	.	..	..	..	..	2	..
Portugal	.	.	..	..	6	..	3	7
Rumania	.	.	..	.	4	6	1	..
Yugoslavia			.	..	4	18	4	..
Argentina	2	4	3	..	16	..	3	..
Brazil	2	..	2		1	6	4	..
Chile	1	..	3	..	8	..	9	..
Peru	..	..	2	..	2	..	4	..
Colombia	..	..	..	..	2	..	..	..
Mexico	..	..	..	..	..	..	..	4
Thailand	..	4	..	.	1	21	4	2
Manchoukuo	..	..	..	..	1	..	..	..

*Figures are necessarily approximate in some instances.
†Probably incorporated in Soviet navy.

Assuming the expected degree of progress to have been m with new construction, the royal navy, by the end of 1940, cluded the following units: 13 battleships; 3 battle cruisers heavy cruisers mounting 8-in. guns; 53 cruisers with guns lesser calibre; 5 anti-aircraft ships (ex-cruisers); 1 minelaye first line aircraft carriers; 230 destroyers, of which 50 w acquired from the United States navy in Sept. 1940; 45 s marines; 35 sloops; 20 fast escort vessels of the "Hunt" type minesweepers; 10 patrol vessels; 3 aircraft tenders; 2 netlay 21 river gunboats; 6 coastal minelayers; about 40 motor torp boats and 3 monitors. How many ships were building in 194 is impossible to say in the absence of any official informa as to the tonnage begun since the outbreak of war. A g many trawlers and patrol vessels of the whale-catcher t known as corvettes, were understood to have been built or quired since Sept. 1939.

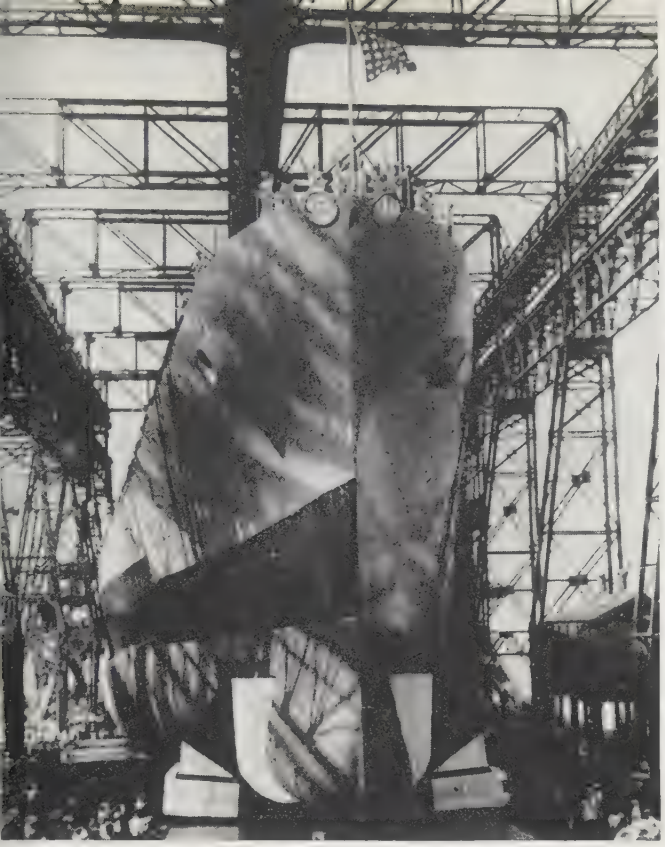
One of the first steps taken by the British government on opening of hostilities was to give notice of suspension of its obligations under the London Naval treaty of 1936, as as under the naval agreements with sundry other countries, t giving all the parties to these conventions freedom from restrictions as to displacement and gun calibre placed on various categories of warships.

The total personnel provided for in the 1939 navy estim was 133,000, but this was increased considerably. Naval fo of the dominions, including the royal Indian, royal Austra and royal Canadian navies and the New Zealand division, are cluded in the above figures so far as material is concerned, not their personnel, which with war additions must amount over 15,000. There were reserves of personnel in other Bri overseas territories, such as Newfoundland, Kenya, South Afr Hongkong, the Straits Settlements and Ceylon.

United States.—Great increases in the numbers of all cla of warships were approved during 1940. At the end of that y the total strength in service included 15 battleships; 18 he cruisers with 8-in. guns; 19 light cruisers with 6-in. guns aircraft carriers; 162 destroyers; 104 submarines; 10 gunbo 27 patrol vessels; 9 motor torpedo boats; 18 aircraft tend 8 light minelayers and 57 minesweepers. Under construction on order were 17 battleships; 48 cruisers; 13 aircraft carri 168 destroyers; 80 submarines; 9 aircraft tenders; 3 minelay 23 motor torpedo boats; 25 motor patrol vessels and 11 m sweepers. In Sept. 1940, the total personnel, including reserv called up for service, amounted to 239,281.

Japan.—Though official information concerning the impe Japanese navy is nearly non-existent, it is believed that at end of 1940 the total strength was: 10 battleships (if one w had been demilitarized has been rearmed as proposed); 12 crui with 8-in. guns; 25 cruisers with 6-in. or 5·5-in. guns; 5 cruisers rated as coast defence ships; 7 aircraft carriers; destroyers; 12 torpedo boats; 62 submarines; 14 subma chasers; 11 aircraft tenders; 18 minelayers; 18 minesweepers 10 gunboats (including river craft). So far as unofficial rep are to be relied on, the following ships (building or complet were: 5 big battleships and 4 small battleships; 6 or m cruisers; 2 aircraft carriers and a considerable number of stroyers, submarines and smaller craft. The total personnel w last reported was 107,000, but has almost certainly been increa since.

France.—As a result of the surrender of June 1940, the Fre navy was by the end of 1940 in a somewhat chaotic state. It appeared to include 7 battleships; 7 cruisers with 8-in. g 11 cruisers with 6-in. or 6·1-in. guns; 1 aircraft carrier; 2 militarized battleships of value only for harbour defence;



ve, left: LAUNCHING of the 35,000-ton U.S. battleship "North Caro-
" June 13, 1940, at Brooklyn, N.Y.
ve, right: THE NEWEST OF U.S. AIRCRAFT CARRIERS, the "Wasp,"
commissioned April 25, 1940
nt: ONLY THE BLACK KEEL of the French battleship "Bretagne" re-
ned above water after it had been shelled by the British July 3, 1940,
he battle of Oran bay
ow: IN AN INDECISIVE NAVAL ENGAGEMENT in the Mediterranean
8 and 9, 1940, the British, firing from a range of 15 mi., scored a near
on the Italian battleship shown in the centre
tom: REPEATING AN OPERATION OF 1918, the British sank concrete-
d ships in the canal at Zeebrugge during their evacuation of Dunkirk in
0, to prevent Germany from using the port as a submarine base

destroyers, of which 27 are between 2,126 and 2,884 tons displacement; 17 torpedo boats, 5 of them of the motor type; 74 submarines; 2 minelayers; 1 netlayer; 1 aircraft tender; 9 sloops; 26 patrol vessels; 20 minesweepers; 36 submarine chasers and 9 river gunboats. Under construction or completing there were believed to be 1 battleship, the "Jean Bart"; 6 destroyers; 4 submarines; 1 sloop and 7 minesweepers. Ships under control of the Vichy government were scattered between Toulon, Casablanca, Dakar and the West Indies, while the others were either in British hands or interned at Alexandria. The total personnel was about 85,000.

Italy.—At the end of Oct. 1940, Italian naval strength comprised 6 battleships; 7 cruisers mounting 8-in. guns; 13 with 6-in. or 5·9-in. guns; 53 destroyers; 66 torpedo boats; 69 motor torpedo boats; 96 submarines; 1 sloop; 1 aircraft tender; 13 minelayers; 41 minesweepers and 11 gunboats. There were under construction 2 battleships; 14 cruisers; 8 destroyers; 4 torpedo boats; 16 submarines; 1 sloop and an uncertain number of motor torpedo boats.

Germany.—At the same date German naval strength was believed to include 3 battleships (assuming the 35,000-ton "Bismarck" to have been delivered according to schedule) plus 2 armoured ships ("pocket battleships"); 2 ancient battleships suitable only for coast defence; 2 cruisers mounting 8-in. guns; 3 or 4 cruisers with 5·9-in. guns; 1 aircraft carrier; 19 destroyers; about 40 torpedo boats; approximately the same number of motor torpedo boats; 2 gunnery training ships, roughly equivalent to sloops and about 50 minesweepers. At the number of submarines in service it is impossible to guess with any approach to accuracy, but there must have been in 1940 about 100, if not more. Under construction, so far as was known, were 3 battleships; 6 cruisers; 1 aircraft carrier and 9 destroyers. More vessels were doubtless laid down since war began. The total personnel undoubtedly exceeded 50,000.

U.S.S.R.—Official information concerning the soviet navy as scanty as in the case of Japan, but the following particu are regarded as reliable. Completed ships included 3 old bat ships; 5 cruisers; 1 aircraft carrier; 40 destroyers; 28 torp boats; 130 motor torpedo boats; 170 submarines and a g many minelayers and minesweepers. Under construction or ab to be begun were: 3 battleships; 2 cruisers; 2 aircraft carriers destroyers and an uncertain number of torpedo boats and m sweepers. Total personnel in 1940 was probably nearly 40,000

Estonia possessed 2 submarines; 1 torpedo boat; 4 minela and a number of smaller craft. Latvia had 2 submarines; 2 m sweepers and 1 gunboat. Lithuania could muster only a si patrol vessel. But under the new political status of these co tries, all these vessels would presumably be absorbed in the so fleet.

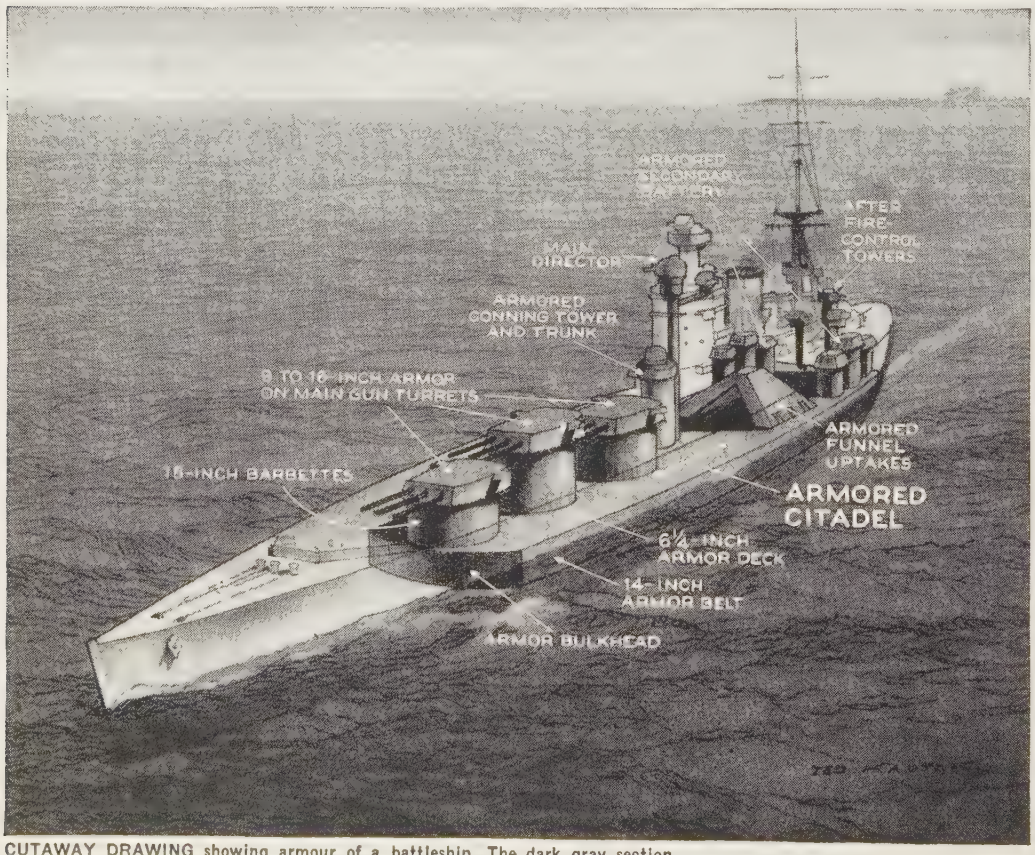
Other European Countries.—Of the minor naval powers, Netherlands had taken the most active steps to add to its na strength prior to the German invasion. The existing fleet, wh was in 1940 either serving with the British navy or in the E Indies, included 5 cruisers; 8 destroyers; 19 torpedo boats which 13 are of the motor type; 1 gunnery training ship; 2 sloo 1 old coast defence ship; 9 minelayers and 11 minesweepers. the various ships that were building in Dutch shipyards, pra cally all were destroyed before the country was evacuated Queen Wilhelmina's government. In the Netherlands Indies th were in 1940 14 vessels of the sloop type and an equal num of patrol vessels, belonging to the local government marine, attached to the royal Netherlands navy. Two minelayers w under construction at Sourabaya.

Of the Scandinavian nations, only Sweden up to the time compiling this record contrived to preserve her neutrality. royal Swedish navy in 1940 comprised 2 cruisers; 8 coast defe ships; 10 destroyers; 21 torpedo boats, 6 of which are of motor type; 16 submarines and 6 minesweepers. There w building 2 coast defence shi 2 destroyers; 5 submarines 36 minesweepers.

So far as can be ascertain the following ships of the ro Norwegian navy were in 1 still in existence, though m of them were in German han 2 coast defence ships; 16 pedo boats, 2 of them of mo type; 6 submarines; 3 minel ers and 10 minesweepers. D mark, when occupied by Germans in April 1940, p sessed a fleet of 2 coast defe ships; 17 torpedo boats; submarines; 1 minelayer an minesweepers. Four vessels gaged on surveying duties fishery protection off Greenl or in Icelandic waters are derstood to have escaped zure. Two torpedo boats w under construction at Cop hagen.

The Finnish navy include coast defence ships; 5 subm rines; 7 motor torpedo boats gunboats and a number of sm minelayers and minesweepe

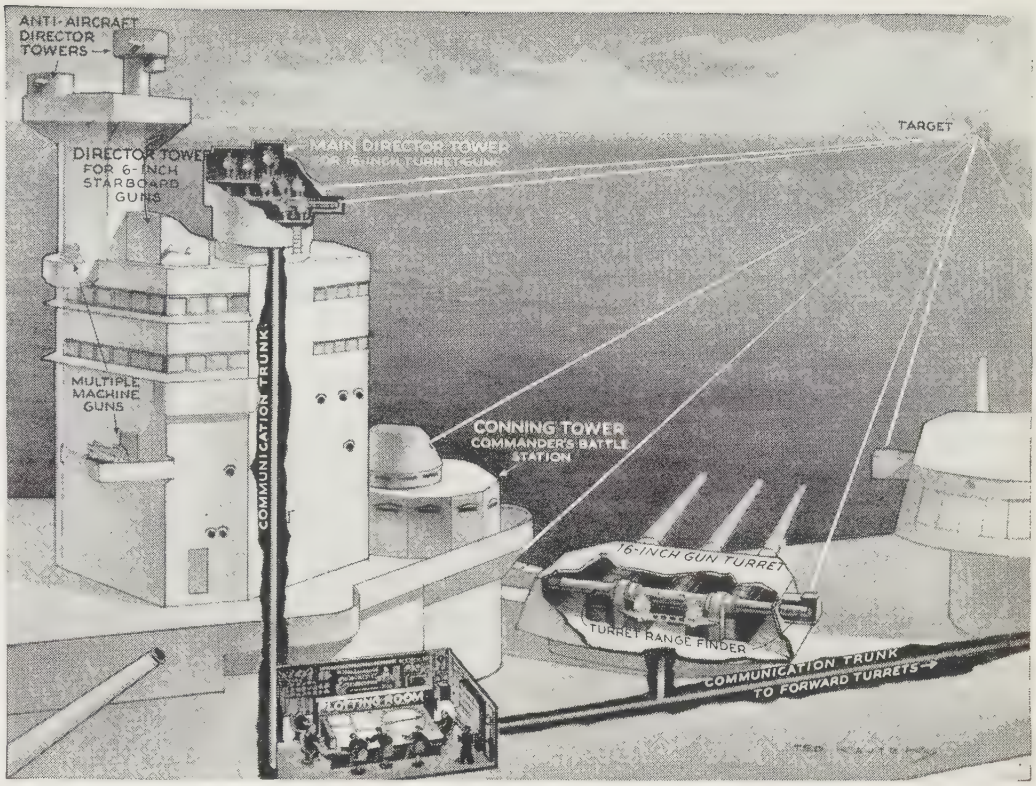
Poland, although her na



CUTAWAY DRAWING showing armour of a battleship. The dark gray section is the armour box which encloses the ship's vitals

ained severe losses when at-
ed by Germany, possessed
940 2 destroyers; 4 sub-
ines (3 of which are in-
ed in Swedish ports); 2
ps and 2 motor patrol ves-

pain has been reorganizing
naval forces since the con-
ion of the civil war. There
e in 1940 left in service 6
sers; 16 destroyers; 6 tor-
o boats; 6 submarines; 4
elayers; 4 sloops; 7 motor
ol vessels and sundry
ller craft. Under construc-
were 2 destroyers; 3 sub-
ines; 2 minelayers and 4
or torpedo boats.
he Portuguese fleet, as mod-
zed under the highly effi-
t regime of 1940, comprised
estroyers; 3 submarines; 7
ps and 4 gunboats. Owing
he European war, a further
gram of new construction
held in abeyance.
reece, at the end of Oct.



CONNING TOWER, director towers, plotting room and section of turret in a battleship

o, possessed 1 old cruiser; 10 destroyers; 13 torpedo boats; 6
marines; 9 minelayers and 2 motor torpedo boats. Two de-
yers and 4 motor torpedo boats were building.
he Turkish fleet was in 1940 made up of 1 old battleship; 4
royers; 9 submarines; 2 old cruisers used for training; 3
or torpedo boats; 3 minelayers; 2 gunboats; 3 minesweepers
various smaller vessels. Four destroyers; 4 submarines and 2
elayers were completing in British shipyards.
umania in 1940 had 4 destroyers; 1 submarine; 3 old torpedo
ts and 3 of modern motor type and some minor vessels. Two
marines and 2 minelayers were building or completing in
nania.
he royal Yugoslav navy possessed 4 destroyers; 4 submarines;
d torpedo boats; 10 motor torpedo boats; 1 aircraft tender;
inelayers; a patrol vessel and an obsolete cruiser of no fight-
value used for training. A destroyer and 2 submarines were
er construction; but as the latter were being built in Ger-
y, they were doubtless appropriated by that country.

outh America.—But for the European war, orders for new
ships would probably have been placed in Great Britain by
eral South American states.
he Argentine navy included 2 battleships; 3 cruisers; 4 coast
ence ships; 16 destroyers; 3 submarines and 14 minesweepers.
o sloops, designed for training duties, were in 1940 being built
rgentina.
razil possessed in 1940 2 battleships; 2 cruisers; 1 destroyer;
rpedo boats; 4 submarines and 8 minelayers. Nine destroyers
e being built in Brazilian shipyards.
hile, which in the efficiency of her navy considers herself
nd to no other country in South America, had in 1940 1 bat-
hip; 3 cruisers; 8 destroyers and 9 submarines. A sloop was
er construction in Chile.
eru has been hindered by the instability of some of her recent
ernments from making much headway in the modernization
er navy. It included in 1940 2 cruisers; 2 destroyers; 4 sub-
ines and some minor craft. Similar considerations apply to
ador, whose sea force amounted to no more than a single gunboat.

Colombia had in service 2 destroyers; 3 gunboats and some vessels of less importance. Venezuela could in 1940 muster 5 gunboats, while Uruguay had 3 modern patrol vessels and one old sloop, used for training. Paraguay's force comprised 3 river gunboats.

Mexico had 4 modern sloops; 2 older vessels of similar category; 10 small gunboats and 3 coast guard patrol vessels. Cuba had 2 sloops, recently reconstructed; 5 gunboats and 7 patrol vessels. A new Cuban naval program was under consideration in 1940, to involve the acquisition of 1 cruiser; 8 sloops; 6 gunboats and some smaller craft.

Haiti had 2 small patrol vessels of no fighting value. The Dominican republic, in addition to an armed transport, had 3 patrol vessels. Nicaragua had a single patrol vessel. None of the other Central American republics appeared to own any vessels of importance.

Asia.—In the far east, the Chinese navy had in 1940 for practical purposes ceased to exist, though it is possible that a few small craft survived in the upper reaches of the Yangtze. Three vessels were under construction at Hongkong.

On the other hand, the navy of Thailand was completely reorganized as regards both material and personnel. Most of the newer ships have been built in Japan or Italy. There were in service in 1940 4 coast defence ships; 1 destroyer; 21 torpedo boats, 9 of which are of the motor type; 4 submarines; 2 sloops; 2 minelayers and sundry smaller craft. Two cruisers were under construction in Italy.

Iran developed a small navy under Italian tutelage. This included 7 gunboats; 3 motor patrol vessels and one or two smaller units. Iraq had 4 patrol vessels, a yacht and a tug.

Manchoukuo, as a satellite of Japan, acquired 1 destroyer; 15 gunboats and 16 patrol vessels. Many of these are river craft.

Developments in naval design were perceptible as the result of the sea experience of the war. For instance, the tendency to augment the anti-aircraft armament of all ships, particularly those smaller craft which have been found to be most vulnerable

to air attack, was very marked. For bigger ships, additional deck armour will unquestionably be demanded in future. Other tendencies will doubtless become apparent as the war proceeds.

For convenience of reference, the table on p. 482 shows the strength in the principal categories of warships of the navies of the world at the end of 1940. (*See* also AIR FORCES; ARMIES OF THE WORLD; BLOCKADE; EUROPEAN WAR; MUNITIONS OF WAR; SUBMARINE WARFARE; TACTICS IN THE EUROPEAN WAR; UNITED STATES: *History*.) (F. E. McM.)

Nazis: *see* ANTI-SEMITISM; ARGENTINA; FASCISM; GERMANY; MINORITIES; SOUTH AFRICA, THE UNION OF.

Nebraska, one of the states formed from the Louisiana Purchase; area, 76,808 sq.mi.; population, 1940, 1,315,834; capital, Lincoln, 81,984. The largest city is Omaha, 223,844. In 1940 39·1% of the population was urban. In 1930, 1,355,702 were white, 13,752 Negroes, 1,262,617 native-born and 115,346 foreign-born.

History.—State officers for 1939–41 were governor, R. L. Cochran; lieutenant governor, W. E. Johnson; auditor, Ray Johnson, secretary of state, Harry R. Swanson; treasurer, John Havekost. In the election of Nov. 1940, Dwight Griswold became the new governor. In the presidential election, Willkie received 352,201 votes and Roosevelt 263,677.

Education. — Higher education is supported by the state at the University of Nebraska and in four teachers' colleges. The State university consists of ten colleges and three schools of collegiate grade. The total enrolment for 1939–40 was 12,268, of whom 8,756 were resident students of collegiate rank. Property and equipment are valued at $12,473,548 and the biennial appropriation for 1939–41 was $7,530,270 (including federal grants). The management of the university is vested in an elective board of regents. The four teachers' colleges offer collegiate training for four years leading to a bachelor's degree. The total enrolment in 1940 was 4,617 and the faculties numbered 205. Control is vested in a board of seven members. Elementary and secondary education is in the hands of local school districts of which there are now more than 7,200 in the state. Financial support is derived almost wholly from the local tax on property. The total enrolment in 1938–39 was 282,102 and the number of teachers employed was 13,791. School property was valued at $82,706,968, school expenditures were $20,319,467 and school indebtedness amounted to $27,530,554.95 (1940).

DWIGHT GRISWOLD, Republican, was elected governor of Nebraska Nov. 5, 1940

Charities and Corrections.—The dependent, delinquent and defective classes are cared for in 17 institutions under the supervision of the State Board of Control. In addition to the penitentiary and reformatories for men and women, there are industrial schools for boys and girls, hospitals for the blind, the deaf and the feeble-minded, three hospitals for the insane, one home for soldiers and sailors, an orthopaedic hospital and a home for dependent children. The total institutional population in 1940 was 9,110 and the legislative appropriation for 1939–41, $5,5 989. In addition there is an appropriation to the state assista fund for the biennium 1939–41 of more than $15,500,000. T fund is administered by a state assistance director in co-operat with the county boards.

Banking and Finance.—State banks under the supervision the state banking department numbered 286 on June 30, 1940 decrease from 415 in 1933. These banks have resources of $ 070,168. There were also 51 building and loan associations w resources of $58,065,176 and 163 co-operative credit associati with assets of $2,805,233. National banks at the same date n bered 135 with resources of $284,167,000.

The total assessed valuation of the state for tax purpose $1,922,271,788. The tax rate for state purposes for 1940 is at 2·57 mills, which is calculated to produce $4,940,238.50. T biennial budget for 1939–41 carried appropriations of $52,000,0 of which about $13,000,000 are federal funds. The chief sour of state revenue, aside from the direct tax on property, are tax on gasoline, motor vehicle licences, taxes on liquors miscellaneous fees and licences. There is no state tax on perso or corporate incomes or on sales. The inheritance tax is collec by the counties. The state has no debt, though that of the lo subdivisions in 1940 amounted to $69,019,857.78. This does include debts of the public power and irrigation districts amou ing to $60,000,000.

Agriculture and Manufactures.—Nebraska is an alm purely agricultural state and its chief products are from the s Its most valuable products are cereals and livestock. The norm production of corn is nearly 250,000,000 bu. and of hogs m than 5,000,000 annually. Other important crops are wheat, o hay, potatoes and sugar beets. Gross agricultural income Nebraska, 1939: principal crops, $53,367,000; livestock and products, $165,707,000; total $219,074,000; government p ments, $28,078,000; grand total $247,152,000.

The chief industries of the state are connected with the pr essing of farm products. The meat packing industry of Om involves 12 establishments, turning out products valued at $10 419,614. Next in order of their importance come the processing milk, flour, feed and mill products; car and car repairing, such minor industries as confectionery, leather and harness, lu ber and millwork and concrete products. In 1937, 24,480 perso were gainfully employed in 1,071 manufacturing establishme and the value of manufactured products was $282,502,287. (L. W. L.)

Necrology: *see* OBITUARIES.

Negroes (American). The civil rights struggle was ag to the fore in 1940. The U.S. preme court refused (Oct. 28) to review the circuit court rul in the Alston case, ordering the city of Norfolk, Va., to ce salary differentials for teachers based on race, and the muni pality agreed to an equalization budget. Salary equalizati petitions were filed in Louisville, Ky., and the widened fo of the high court ruling covered similar petitions elsewhe The supreme court also set aside (Nov. 12) an Illinois decisi to sustain a racially restrictive real estate covenant in the Ha berry case, which although not passing directly on the cons tutionality of such residential covenants, invalidates the ty operative in the Chicago area affected. By congressional acti on several defence bills, particularly aviation and vocatio defence training, racial discrimination was forbidden, and the former case, provision for the training of Negro person was expressly authorized; while by executive order (Nov. 1 the federal civil service rules were amended to include prohibiti

discrimination on account of race, the congress having pre-
isly passed a bill setting aside the requirement of photographs
civil service examinations. Following numerous protests of
riminatory exclusion from combatant and specialized branches
he armed forces, and a disputed public statement of policy,
ed by the White House (Oct. 9), a supplementary state-
t of a revised policy to secure the more effective and equitable
gration of Negroes into the armed forces was issued Oct. 25,
William H. Hastie appointed as civilian aide to the secretary
war and Major Campbell C. Johnson assigned to the director
elective service to be "actively concerned with these further
elopments of policy." It had been pointed out that Negroes
stituted only 1·5% of the regular army personnel (4,451 out
229,636), and were by custom excluded from many branches
ranks in the service, in the air, marine corps and in the
y except as mess attendants. Oct. 25, Col. Benjamin O. Davis
appointed on presidential nomination to the highest active
vice rating yet attained by a Negro—brigadier-general. War
artment reports show Negro officer personnel available in the
ular reserve of 353, R.O.T.C graduates 554, and R.O.T.C. per-
nel totalling 4,926, with over-quota registration in the new
limited aviation and vocational defence training openings.

bsorption of Negroes back into industry from the unemployed
relief ranks was still disproportionately slow, owing to dis-
nination and relative lack of labour union protection. In
south, the agricultural situation did not improve and a major
nomic crisis impended, especially for the Negro tenant farmer
farm labourer. In urban areas, the more extended operation
the wages and hours legislation brought about considerable
provement both in hours and wages. Considerable areas of
gro labour were not, in 1940, yet so protected—domestic
vice and farm labour. A. Philip Randolph, pioneer Negro
our leader, former president of the National Negro congress,
gned on a split with alleged radical domination of the central
mittees of that important clearing-house organization. The
tional Association for the Advancement of Colored People,
cializing in the legal civil rights and the anti-lynching cam-
gn, announced with the Chicago (Hansberry) decision its 17th
. supreme court victory. The National Urban league celebrated
November its 25th anniversary; and the Association for the
dy of Negro Life and History similarly celebrated its 25th in
tember.

ducational and Cultural.—The *Crisis* annual survey of edu-
ion reported 3,913 Negro college and professional graduates
of a total of 33,340 college students; 30,890 of these enrolled
Negro colleges. Twelve doctoral degrees; 40 Rosenwald fellows
various fields of science, social science, art, music and educa-
n; one Guggenheim fellowship (creative sculpture) and the
lication of notable books (see *Bibliography*) showed steady
ns in the research scholarship and creative art. During July–
gust an extensive commemorative exposition of 75 years of
gress since emancipation was held at the Chicago Coliseum
ler the auspices of the state of Illinois, with assisting U.S. sub-
, and in December an extensive exhibit of art, historical
uments and a week's festival of Negro music commemorated in
shington the 75th anniversary of the 13th amendment under
auspices of the Library of Congress. The art exhibits at both
ces showed the rapid spread and progress of the pictorial and
stic arts among younger generation Negroes, much of it due to
sponsorship and widened facilities of the Federal Art project.
hard Wright published his sensational social novel, *Native*
(Book of the Month choice and sales of over 250,000
ies). Dorothy Maynor, vocal find of 1940, was awarded the
vn Hall Endowment Series medal; while Charles Holland,
or, Virginia Lewis, soprano and Louise Burge, contralto, came
to wide public notice, the latter as soloist with the N.Y. Philharmonic and the Schola Cantorum in the première at the Lewisohn stadium, July 25, of William Grant Still's choral ballad, *And They Lynched Him to a Tree,* poem by Katharine Chapin Biddle. Negro achievement was celebrated at the N.Y. world's fair with a special week, July 23–28, and 41 inclusions of Negroes occurred in the American Hall of Fame listings of *The American Common* at the fair. The Katharine Dunham dancers, inaugurating one of the first recognized repertories of Negro ballet, after recital successes, were incorporated in the cast of the outstanding Ethel Waters' musical comedy success, *The Cabin in the Sky.* Hattie McDaniels was awarded the best supporting character Motion Picture Academy award for her role in *Gone With the Wind,* and Ben Johnson, former Columbia track captain, was awarded the Harrison K. Bird medal as the outstanding Columbia university track athlete for the decade 1930–40.

Hampton institute inaugurated a new president, Malcolm MacLean, and a progressive revision of their educational program with a widely representative Hampton conference on the Negro and National Defence.

The year's obituary included Marcus Garvey, June 10 in London at the age of 53; Robert L. Vann, age 61, proprietor-editor of the largest Negro newspaper, *The Pittsburgh Courier* and former assistant to the U.S. attorney-general, Oct. 24 at Pittsburgh; Sergt. George H. Wanton, only living Negro holder of the Congressional medal, Nov. 27 at age 73 in Washington, D.C.; Robert S. Abbott, founder-owner of the *Chicago Defender,* pioneer in nationwide Negro journalism, Feb. 29, in Chicago; James C. Napier, prominent reconstruction politician and former registrar of the U.S. treasury, April 27 at Nashville, Tenn.; Robert R. Moton, immediate successor of Booker T. Washington as president of Tuskegee institute, May 31 at Capahosic, Va.; Bishop W. A. C. Hughes, July 12 in Baltimore, a few weeks after his election, along with Lorenzo H. King, as one of the two new Negro bishops of the Methodist Episcopal church.

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(A. LER. L.)

Nelson, Donald Marr (1888–), U.S. business executive, was born Nov. 17 at Hannibal, Mo. and was graduated from the University of Missouri in 1911. The next year he was employed by Sears, Roebuck and company as a chemical engineer. In 1927 he was appointed general merchandise manager of the company, in 1930 vice-president in charge of merchandising, and in 1939 executive vice-president and chairman of the executive committee. He is a director of *Encyclopædia Britannica.*

On May 29, 1940 Nelson was appointed full-time acting director of the U.S. treasury's procurement division. On June 28 he was named co-ordinator of national defence purchasing in co-operation with the advisory commission of the Council of National Defence. Four months later he became head of the commission's priorities division. In the reorganized "super-defence" board (Office of Production Management), created Jan. 7, 1941 by President Roosevelt, Nelson was appointed executive director of the division on purchases and thus assumed complete responsibility for buying billions of dollars of material for the defence program.

Neoprene: *see* CHEMISTRY; CHEMISTRY, APPLIED.

Nepal, an independent kingdom (area *c.* 54,000 sq.mi., est. pop. 5,600,000) lying between India and Tibet—and in-

cluding Mt. Everest—ruled in fact by the prime minister (hereditary), Maharajah Sir Joodha Shamsher Jung Bahadur Rana. The country exports rice, jute, oilseeds, hides and especially timber, and imports cotton, textiles, metals, salt, sugar, etc. It maintains the closest association with British India, both in commerce and in the provision of recruits for the fine Gurkha regiments of the Indian army. Since the outbreak of war in Europe 8,000 Gurkha troops were offered for the garrison of India. Nepal has, in addition, subscribed liberally to the various war funds.

In May 1940 the marriage took place of the crown prince (1920–) to a granddaughter of the prime minister. The British envoy, Lt. Col. G. L. Betham, C.I.E., M.C., resides at the capital, Khatmandu (pop. *c.* 80,000).

Nervous Diseases: *see* MEDICINE; PSYCHIATRY.

Nervous System. The announcement of the importance of vitamins in maintaining the function of the nervous system has had wide influence in changing our pessimistic concept of therapy of the so-called degenerative diseases. Pathologic changes in the central nervous system not due to tumours or infections were in 1940 optimistically treated with vitamins. Various forms of neuritis were successfully treated by vitamin B_1 (thiamin) as were also certain central lesions. Local pains produced by mechanical bony pressures, neuralgias and headaches were also treated by this vitamin, but enthusiastic reports required confirmation. Vitamin B_6 (pantothenic acid) was reported successful in treating dystrophic muscular conditions and vitamin E (tocopherol) had favourable mention in the treatment of muscular atrophies. If scientific research confirms these tentative reports the development of thousands of helpless cripples in the future may be prevented.

Other successful chemotherapy has also been reported. Quinine was considered in 1940 efficient in relieving tonic muscle spasms in certain peculiar dystrophic muscular conditions (myotonia congenita and dystonia). Sulphanilamide continued to save victims of streptococcus meningitis; sulphapyridine was efficient in the treatment of pneumococcus meningitis.

Pharmacologic shock therapy in the psychosis spread to most clinics and state hospitals. The results of insulin shock in schizophrenics finally proved to be temporary and latest statistical studies revealed no greater percentage of remissions than occur spontaneously. Beneficial effects of metrazol convulsive shock therapy on melancholia and depressions were unquestioned. Psychoses are shortened from years to a few weeks. There was still doubt whether cerebral damage is not also a result of the treatment. Curare was used preliminary to metrazol for the purpose of decreasing the convulsive seizures. An electrical method was used which produces a convulsive seizure when current is passed through the head. The seizure is less violent than that prod by metrazol and there is no anxiety on the part of the pa because there is an amnesia for the treatment.

Benedeck and Rubinstein in *Psychosomatic Medicine* 1939) made extremely important studies on the relation o ovarian cycle in women to their emotional trends. This scientifically confirmed hypotheses long held in dynamic psy ogy that changes in energy gradients arising from activit glands of internal secretion affect psychic tensions. With and other researches in psychosomatic medicine psychoge of physical disturbances was becoming clearer and indicativ possible therapy and pre-morbid prophylaxis. (*See* also E CRINOLOGY; MEDICINE; PSYCHIATRY; VITAMINS.) (R. R. G

DUTCH PRISONERS OF WAR lined up in May 1940 outside the fortress they had defended only a few hours before

Netherlands, kingdom of northwest Europe, member o League of Nations. Bounded N. by the N sea, E. by Germany, S. by Belgium and W. by the North Ruler, Queen Wilhelmina (born, 1880; succeeded, 1890; crow 1898); president of the council of ministers: Prof. P. S. brandy. National flag, red, white and blue, in equal horizo stripes.

Area and Population.—The area 13,440 sq.mi.; pop. Dec. 31, 1938) 8,728,560. Chief towns (pop. Dec. 31, 1 Amsterdam (commercial cap. 793,526); Rotterdam (612,3 The Hague (political cap. 495,518). Language: Dutch; relig Christian (1930 census: Dutch Reformed Church: 2,732, Roman Catholic: 2,890,022).

History.—The Netherlands, which had pursued a policy strict neutrality during the first part of the European confla tion, were attacked by Germany on May 10. 1940. The att had begun without Germany attempting to produce even single justification. Three hours after the outbreak of hostil the German minister visited the ministry of foreign affair communicate on behalf of his government that Berlin had lea of aggressive plans of the Allies against Germany, worked with the knowledge of the Netherlands and Belgium. To representation of the facts, coupled with several acts of agg sion, only one reply could be given: The Netherlands conside themselves at war with the German Reich.

It may certainly be called a success for the Dutch forces t the German operations against the heart of the country achie their end only on the fifth, instead of the first or second (*See* EUROPEAN WAR.) Thanks to this bitter resistance it possible for the queen and the government to leave the coun When the military situation made further resistance on l useless, the Dutch naval forces in the north and the centre w ordered to leave the Dutch coasts as soon as possible for E land, to continue the fight from there.

From the beginning the German forces openly set out to h the queen. When in the early morning of May 13 the military si ation had grown so grave that the fall of the fortress of Holl

to be seriously reckoned with, it became imperative to pre- t the queen and the government from falling into the hands of enemy. The Dutch queen was able to leave the country that ning. In the evening she was followed by the members of the ernment in a British warship. The next day, the Neth- nds commander-in-chief issued an order of the day to his es and to the civilian population in which he told them of the arture of the queen and the government and explained that had become necessary on account of the critical military ation of the fortress of Holland.

t the same time General Winkelman stated that the govern- it had instructed him to continue fighting till the moment n further fighting should become useless and had delegated necessary powers to him.

n accordance with these instructions the commander-in-chief lly entered into negotiations with the enemy. This meant that kingdom of the Netherlands under the leadership of the head tate and the constitutional government remained at war with many. The cessation of hostilities in the Netherlands had only ilitary and a local significance.

he Netherlands continued the war at the side of their allies n those means which they still had at their disposal. Among se there was first of all the navy which had already resumed ve service; next to that the immense economic resources of overseas territories and the relatively large merchant marine. ether these factors formed no mean contribution to the Allied effort.

After May 15 the Netherlands government was temporarily iciled in England from where the Dutch queen and her min- rs were carrying on the government of the Netherlands terri- y in the East Indies, and in Surinam, Curaçao, Aruba and the er Dutch islands in the Caribbean sea, and the promotion of Netherlands' political, economic and cultural interests all r the world.

he royal Netherlands government offices in London comprised he established departments; from them there was regular con- t with the Dutch diplomatic and consular posts and close co- ration with the loyal governments of the Netherlands overseas itories with rulings on matters of general policy and on many nomic and commercial questions.

The Dutch mercantile marine did not fall into the hands of my and continued to ply the seas between the Netherlands rseas territories and all parts of the world in the interests of de, while a million tons of shipping space were time-chartered the British government in the interest of the Allied cause. ese matters were being managed by the Netherlands Shipping l Trading Committee Ltd., London, a body instituted by the tch government and acting in close co-operation with Dutch l British authorities.

Legislation was being carried on by the Dutch queen, in con- ction with the cabinet, in order to safeguard Dutch interests over the world and more especially the interests in foreign ntries of the residents in upied Holland. Nearly all portant Dutch companies vever, which normally oper- d from the Netherlands, had ir headquarters moved to overseas territories where government appointed new naging directors.

A Dutch legion was formed England soon after the inva- n; in Aug. 1940 all able- lied Dutchmen between the ages of 20 and 36 were called up for military service.

Education.—In 1938: elementary schools 7,812; scholars 1,242,778; secondary schools 288; scholars 62,301; high schools (1937–38) 4; scholars 3,037; universities (1937–38) 6; scholars 9,471.

Banking and Finance.—Revenue, ordinary (est. 1939), 602,-153,493 florins; expenditure, ordinary (est. 1939), 744,732,786 florins; public debt (Dec. 31, 1938), 3,986,628,806 florins; notes in circulation (July 31, 1939), 1,036,976,000 florins; gold and silver reserve (July 31, 1939), 1,153,448,000 florins; exchange rate (average 1938), 8.89 florins = £1 sterling; (July 31, 1939) 8.82 florins = £1 sterling.

Trade and Communication.—Overseas trade (merchandise) 1938: imports 1,414,768,000 florins; 1939: 983,450,000 florins; exports, 1938: 1,039,156,000 florins; exports, Jan.–Aug. 1939: 703,710,000 florins. Communications and transport 1938: roads. suitable for motor traffic 16,000 mi.; railways, open to traffic 2,016 mi.; rivers and canals, navigable 4,817 mi.; airways, distance flown 6,629,000 mi.; shipping (June 30) 2,855,400 gross tons; launched (July 1938–June 1939) 246,400 gross tons; entered with cargoes 27,606,524 net tons; cleared with cargoes, 23,151,428 net tons. Motor vehicles licensed (Aug. 1, 1938): cars 94,000; buses 4,088; trucks 50,988; cycles 55,140; wireless (June 30, 1939): registered receiving sets 839,542; connections with radio-distributing-systems 368,710.

Agriculture, Manufactures, Mineral Production.—*See* COAL INDUSTRY; FUEL BRIQUETTES; HOGS; LIVESTOCK; SUGAR; SUPERPHOSPHATES. (H. F. D. B.)

Netherlands Colonial Empire.

Total area (approx.) 845,800 sq.mi.; total pop. (est. Dec. 31, 1938) 76,401,000.

The table lists the colonial possessions of the Netherlands, together with statistics appropriate to each of them, including the mother country. (X.)

History.—The Netherlands Indies, Surinam and Curaçao were in 1940 continuing their existence much as usual, although the army and navy had been mobilized and strengthened since May and a great deal of emergency legislation had been necessary. There was a wonderful display of loyalty to the queen and of sympathy with the misfortunes of the mother country from the whole community, natives and Chinese no less than Europeans.

Although the East Indies were in very difficult economic straits themselves, a voluntary subscription of funds realized £1,000,000 within a few months, the major part of which was destined for the purchase of 50 Spitfires and 18 Lockheed bombers to be used for the common cause.

There was at the close of 1940 a naturally serious concern in the Netherlands Indies in connection with the unstable condition of affairs in the far east and everything was being done to speed up land, sea and air defences in order to be able to meet any emergency. (H. F. D. B.)

Colonial Possessions of the Netherlands and Essential Statistics

Country and Area, sq. miles (approx.)		Population est. Dec. 31, 1938 (000's omitted)	Capital	Status	Governors, Premiers, etc.
NETHERLANDS	13,120	8,729	The Hague	kingdom	*Ruler:* Queen Wilhelmina *Premier:* Professor P. S. Gerbrandy
ASIA					
NETHERLANDS INDIES, including Java and Madura, Sumatra, Celebes, Borneo (D.), New Guinea (D.), Timor (D.), etc.	774,600	67,400 (est. Dec. 31, 1937)	Batavia	colony	*Governor-General:* Jonkheer Dr. A. W. L. Tjarda van Starkenborgh-Stachouwer.
AMERICA					
CURACAO	386	101	Willemstad	colony	*Governor:* G. J. J. Wouters.
SURINAM (Dutch Guiana)	57,700	171	Paramaribo	colony	*Governor:* Dr. J. C. Kielstra.

Neutrality. **Inter-American Problems.**—The close of the year 1939 was marked by the battle between British warships and the German pocket battleship "Graf Spee," followed by the scuttling of the German ship off the port of Montevideo. In answer to the formal protest of the 21 American republics against this violation of the "security zone," the British government replied on Jan. 14, 1940, insisting that it could not abandon its legitimate belligerent rights unless it were given assurance that the adoption of the zone would not provide German warships with "a vast sanctuary" from which they could emerge to attack its shipping and into which they could retire to escape pursuit. The French government replied in like effect. The German government insisted that the British and French possessions on the American continent gave those powers a position of advantage which impaired the effect of the security zone from the outset. Following closely upon these replies came the case of the German freighter "Wakama," which was sunk by its own crew on Feb. 12 off the coast of Brazil when summoned to stop by a British war vessel. Again on March 9 the German merchant vessel "Hannover" was scuttled by its own crew off the coast of the Dominican Republic on being intercepted by a British war vessel apparently for purposes of search and capture. In both cases the American republics, acting through the president of Panama, entered a collective protest to Great Britain; but no further action was taken.

In the meantime the Inter-American Neutrality committee, which had been created at the meeting of foreign ministers at Panama in 1939, began its sessions on Jan. 15. On April 27 it presented a formal recommendation on the security zone, pointing out the legal arguments in justification of the zone and proposing that in the event of future violations of the zone the American republics should appoint a committee to determine which of the belligerents took the initiative in the conflict and should deny the privileges of their ports to the ships of that belligerent. Other recommendations of the committee dealt with internment, submarines, auxiliary transports, telecommunications and the inviolability of postal correspondence. On this last subject the committee sought to take account of the claim of the belligerent to search for contraband by recommending that epistolary correspondence be separated from other kinds of mail and be limited to letters and business papers, which must not contain bank notes or other papers of value to the bearer, gold, jewels or other merchandise. At the meeting of foreign ministers held at Havana, July 21–30, the work of the neutrality committee was extended to include the drafting of an inter-American convention covering the whole field of international law in respect to neutrality, in addition to other concrete problems of more immediate concern. No action was taken by the meeting with respect to the "security zone," other than to renew the condemnation of hostilities within the zone and to instruct the neutrality committee to prepare a preliminary draft of a convention dealing with the juridical effects of the zone and the measures of co-operation which the American states might be ready to adopt to obtain respect for it.

European Problems: The "Altmark" Case.—On Feb. 16 a British cruiser attacked the German auxiliary transport, "Altmark," in neutral Norwegian territorial waters. On board the "Altmark" were some 300 British officers and men belonging to various British merchant vessels which had been captured and sunk by the German warship "Graf Spee." The Norwegian government protested against the violation of its neutrality, insisting that the "Altmark" had the right to navigate through Norwegian territorial waters. The British government, in reply, justified the rescue of the prisoners on the ground that the Norwegian authorities had refused to conduct a search of the vessel to determine if there were prisoners on board; and at the same tim asserted that German warships should not be permitted to n use of Norwegian waters as a means of escaping capture month later the British government undertook to intercept man traffic by laying mines at certain points within what it scribed as the "covered way" of Norwegian territorial waters

The Invasion of Norway and Denmark.—On April 9 Germ simultaneously invaded the neutral territories of Norway Denmark. Denmark yielded almost without resistance. Nor sought to defend itself, and Great Britain sent naval force its aid. Within a few weeks, however, Norway was overru German troops. On April 13 President Roosevelt denounced "unlawful exercise of force" against the two small nations w had always observed "the highest standards of national and in national conduct." At the same time the resistance of Nor led the president to decide that a "state of war" existed betw Norway and Germany, calling for a proclamation of neutrality the part of the United States and the application of the laws regulations connected with neutrality. The coast line of Nor was now included in the "combat area" from which American sels were excluded. The proclamation was not extended to D mark.

The Invasion of Holland, Belgium and Luxembourg.—I lowing the invasion of Holland, Belgium and Luxembourg on night of May 9–10, President Roosevelt, on May 11, included three countries under the terms of a single proclamation of n trality, applying to them as to Norway the terms of the neutra laws and regulations. This, however, did not prevent the pr dent from stating in a public address on May 10 that the "cr invasion" of those countries had "shocked and angered the pe of the United States." At the same time the president issued executive order "freezing" the credits of Norway, Denmark, H land, Belgium and Luxembourg in the banks of the United Sta so as to prevent any temporary governments that might be set in those countries from drawing upon them. On May 19 the American republics, acting upon a proposal of the government Uruguay, based upon a resolution adopted at Panama in 19 put forth a joint declaration protesting against the "unjustifia and ruthless violation by Germany of the neutrality of Belgi Holland and Luxembourg."

The government of Argentina had proposed that the Ameri republics abandon the status of "neutrality" in favour of that "nonbelligerency"; but the United States government replied t it knew of no legal status between neutrality and war.

Reaction to the Defeat of France.—The swiftness and ru lessness of the German advance through Holland and Belgium the imminent peril to France and Great Britain caused im diate reactions in the policy of the United States and marked beginning of a succession of acts which could not be justified the technical law of neutrality. On June 10, following the entra of Italy into the war, President Roosevelt, in a public address the University of Virginia, went further than formal protest. Af describing the efforts of the government to maintain peace in Mediterranean area, he made the bitter remark that "the ha that held the dagger" had "struck it into the back of its nei bour." Nevertheless, on the same day, the usual proclamatio and regulations were issued concerning the neutrality of United States between Italy and the Allies. On June 15, howev in answer to the appeal of Premier Reynaud of France for he the president stated that the government of the United Sta had already "made it possible for the Allied armies to obtain d ing the weeks that have just passed aeroplanes, artillery a munitions of many kinds," and that so long as the Allied gove ments continued to resist, the government of the U.S. wo "redouble" its efforts in this direction. The reference of the pre

was in part to the surplus government stores which had been to the Allies by the contrivance of returning the guns and r material to the manufacturers who then, in their capacity as ıte citizens, sold them immediately to the Allies. The indirect ıod of transfer was clearly an evasion of the duty of the ral government not to furnish supplies to either belligerent, its justification must be placed upon other grounds than the of neutrality.

e Defence Pact with Canada.—On Aug. 18 President sevelt and the prime minister of Canada, W. L. Mackenzie g, announced that after discussion of mutual problems of de- e in relation to the safety of Canada and the United States d been agreed to set up a permanent joint board of defence. was equivalent to an informal defensive alliance between the countries; and while it was in keeping with the policy an- ıced two years earlier by the United States, it was not con- nt with the position of neutrality still maintained by the ed States in principle. The fact that it was justifiable as a ssary extension of the Monroe Doctrine did not change the acter of the act in respect to the international law of rality.

cquisition of Naval Bases in Exchange for Destroyers.— ally inconsistent with neutrality, if otherwise justifiable, was bargain with Great Britain by which the United States ac- ed 99-year leases in British possessions extending from New- ıdland to British Guiana in return for the transfer to Great ain of 50 over-age destroyers. In both instances it was as- ed that the United States would use the bases as part of its em of national defence against contingencies arising in the t of a German victory. The transfer of the destroyers raised l difficulties in respect to a number of statutes having as their ct the defence of the United States and the maintenance of eutrality. The chief stumbling block was the act of June 15, , sec. 3 of which made it unlawful to send out of the jurisdic- of the United States, when neutral, any vessel built, armed or pped as a vessel of war, with any intent or under any con- t that the vessel should be delivered to a belligerent nation, vith reasonable cause to believe that the vessel would be em- ed in the service of a belligerent after its departure from the ed States. The attorney general gave an opinion holding the statute was directed against vessels built to the order belligerent, and that in consequence it would prohibit the sfer of certain smaller "mosquito" boats, which it was pro- ed to transfer with the destroyers, but would not apply to destroyers themselves, since they had not been built to the er of Great Britain. This interpretation was held to be jus- d by sec. 2 of the same act which gave to the president the er to detain privately-owned armed vessels in port only when owner could not prove that they would not be sold or de- red to a belligerent within the jurisdiction of the United States n the high seas—terms which appeared to indicate that the ıibition against sending vessels out of the jurisdiction of United States was not intended to be absolute, but to apply to vessels built to the order of a belligerent.

eutrality and the Right of Self-Defence.—The opinion of the attorney ral sought to reconcile the transfer of the destroyers to Great Britain the obligations of the United States under the international law of rality by arguing that what international law forbade was the building rmed ships to the order of a belligerent, not the sale or delivery to a gerent in a foreign port of armed vessels already built, in line with the s of the act of 1917 which had been passed to meet the obligations of United States. But the transfer was justified by international lawyers broader grounds. The invasion by Germany of Norway, Denmark, and, Belgium and Luxembourg had, it was argued, undermined the dations of neutrality and made all other states realize that their rality was in itself no guarantee that they could escape being drawn the war. Hence it became necessary for them to take what measures could for their own defence. If these measures were inconsistent with ıormal status of neutrality, they were justified by the right of every to defend the principle of law upon which the obligations of neutrality rested, namely, the observance by belligerents of the acknowledged rights of neutrals. Moreover, it was well established in international law that a neutral state, when wronged by a belligerent, might resort to such reprisals as the gravity of the offence appeared to warrant. Germany, it was argued, had at the very outset of the war violated the Kellogg pact and given just ground even then for measures of reprisal by the United States. The subsequent violations by Germany of the neutrality of its small neighbours merely added to the gravity of its original offence; while the military successes of Germany only served to bring home to the United States the threat to its own national interests from the general breakdown of law and order. Under such circumstances the United States was not only justified in refusing to give Germany the benefit of the observance of neutral duties, but might go further and give to the Allies such material aid as it believed proper without losing thereby its status as a neutral, unless Germany chose to take the initiative in declaring war.

Neutrality in Transition.—The signing by Japan on Sept. 27, 1940, of a tripartite defensive alliance with Germany and Italy marked the abandonment by Japan of strict neutrality, without, however, making Japan a belligerent. So also the acceptance by Rumania in October of a form of German protectorate took that state out of the group of those still technically neutral, and led to a proclamation by the president "freezing" the credits of Rumania in banks of the United States. On Oct. 28 the government of Greece announced that it regarded the Italian ultimatum as equivalent to a declaration of war. Hostilities broke out immediately, but it was not until Nov. 15 that President Roosevelt proclaimed the neutrality of the United States between Italy and Greece and extended to Greece the regulations already in force against Italy. On Nov. 20 Hungary formally joined the three-power pact between Germany, Italy and Japan. Egypt continued to remain neutral in spite of Italian attacks upon Egyptian territory. Eire (Irish Free State), in spite of being a member of the British commonwealth, continued to maintain its neutrality in spite of urgent appeals from the British government that the royal navy be permitted to use ports on the west and south coasts of the country. (*See* also INTERNATIONAL LAW; LEAGUE OF NATIONS; PROPAGANDA.) (C. G. FK.)

Nevada, Emma (1862–1940), U.S. operatic soprano, was born in Austin, Nev., the daughter of Dr. W. W. Wixom. She early displayed musical talent and began to study in Oakland, Calif., when she was eight years old. Later she studied under Marchesi in Vienna. When she began to appear in opera she assumed the name Nevada, after her native state. She sang leading parts in many European cities and made her American debut in 1884. She married Dr. Raymond Palmer of London in 1885.

Her admirers ranked her with Patti. She died in Liverpool, England, on June 20.

Nevada, admitted into the union on Oct. 31, 1864, has two popular names, the "Sagebrush" and the "Silver State"; land area is 109,821 sq.mi., water area is 869 sq.mi., total area is 110,690 sq.mi.; population according to the U.S. census of 1940 is 110,247.

Capital, Carson City, 2,478. Reno, population 21,317, stands in 474th place among the cities of the U.S. Of the state's population 39·3% are urban as compared with 37·8% in 1930; in 1930, 89·4% of the population were white; 6·6% Indian; 3·4% Mexican or oriental; and ·6% Negro. About 83·4% are native born and 16·6% are of foreign origin.

History.—The Democratic vote for Franklin D. Roosevelt in the 1940 presidential election was 31,945, the total vote for Wendell L. Willkie, Republican nominee, was 21,229. Outstanding events of the year 1940 were the election on Nov. 5, closely followed by the death of Key Pittman, for 26 years United States senator for Nevada. Pittman, again elected for a six-year term, died in Reno on Nov. 10, after a brief illness. The electorate approved the following amendments to the state constitution: All licence fees and gasoline tax fees paid by motor vehicles were to be expended for public highway work in Nevada. The second amendment denied the legislature the power to abolish any county in Nevada unless the voters of the county affected shall first approve such abolishment.

The principal state officials were: governor, E. P. Carville; lieutenant governor, Maurice J. Sullivan; secretary of state, Malcolm McEachin; attorney general, Gray Mashburn; state treasurer, Dan W. Franks; state controller, Henry C. Schmidt; surveyor general, E. W. McLeod; mine inspector, Matt Murphy; state highway engineer, Robert A. Allen; U.S. senators, Pat Mc-

Carran and Berkeley L. Bunker; U.S. representative in congress, J. G. Scrugham. Chief justice of the supreme court is E. J. L. Taber; associate justices are Edw. A. Ducker and William E. Orr.

Education.—The University of Nevada in Reno had an enrolment of 1,267 during the year 1939–40, composed of 787 men and 480 women; enrolment as of Jan. 1, 1941, was 1,142, composed of 718 men and 424 women. In 1940 there were 249 elementary schools, 14 kindergartens and 45 high schools in Nevada, staffed by 633 elementary teachers, 14 kindergarten teachers and 268 high school teachers. The total enrolment of school children was 20,746, an increase of 10%.

Banking and Finance.—The state of Nevada has a treasury surplus and has no bonded debt outside the state and has never defaulted a bond issue. The state tax rate declined over a period of years. The state always keeps within its budget. As of June 30, 1940, the Nevada treasury surplus broke down into the following terms:

Net cash available in treasury	$1,617,183.41
Balance between investment and indebtedness	3,170,752.86
Department revolving funds	43,800.00
	$4,831,736.27

The total resources of the 11 insured commercial banks in Nevada totalled $44,694,000 in 1940 and deposits were listed as $40,810,000.

Agriculture and Mineral Production.—According to the U.S. farm census there were 3,696 farms in Nevada. The state had a total farm acreage of 3,621,769 acres. The number of cattle on Nevada ranges were 360,000 beef cattle; 21,000 dairy cows; 23,000 swine; and 840,000 sheep; horses totalled 39,000 and mules 2,000. Agricultural production as of Jan. 19, 1941: Corn 120,000 bu.; wheat (19,000 ac.) 483,000 bu.; oats (7,000 ac.) 280,000 bu.; barley (15,000 ac.) 540,000 bu.; hay (325,000 ac.) 534,000 bu.; potatoes (2,300 ac.) 391,000 bushels.

The mineral production for 1940, stimulated by the increased demand for metals, showed an increase over the totals for the year 1939. Activity was noticeable in properties producing antimony, chromium, manganese, mercury, nickel, tin and tungsten.

The U.S. bureau of mines reported that metal mining in Nevada for the year 1940 gave a total production of gold, silver, copper, lead and zinc valued at $35,876,782, exceeding that of any year since 1918. Copper displaced gold as Nevada's most valuable mineral product in 1939, but the output did not equal either in quantity or value the mark set in 1937.

Gold production exceeded that for any year since 1916. In 1939, 891 lode mines and 104 placer mines produced 361,518 fine ounces of gold valued at $12,653,130; 4,316,029 fine ounces of silver valued at $2,929,668; 133,194,000 lb. of copper valued at $13,456,000 and zinc valued at $647,712. (E. C. D. M.)

Newbery Medal: *see* AMERICAN LIBRARY ASSOCIATION.

New Brunswick, one of the original provinces which united to form the dominion of Canada in 1867; area 27,985 sq.mi.; population, according to the dominion census of 1931, 408,219; estimated Jan. 1, 1941, 451,000. Capital, Fredericton, 8,830. The only other cities are Saint John, 47,514, the most important port, and Moncton, 20,689, the main divisional point of the Canadian National railway in the maritime provinces. Of the province's population 263,432 are rural, or 64%; 403,049 are Canadian born or nearly 99%. The present government assumed office in 1935 as the result of a liberal victory over the conservatives.

The lieutenant governor, who is appointed by the dominion government for a term of five years, is W. G. Clark. The premier and minister of public works is A. A. Dysart.

The enrolment in the public day schools was (1940) 92,773, in private day schools 2,954. There are two universities in the province, the University of New Brunswick, which is financed and controlled by the government and has an enrolment of 3[illegible] and Mount Allison university with an enrolment of 430. The estimated wealth (1940) of the province was $730,297,000; wealth per capita $1,739. The net value of manufactured products in 1938 was $31,578,262, a slight increase over 1937. The gross value of agricultural products in 1938 was $27,473,000.

BIBLIOGRAPHY.—*The Royal Gazette; The Annual Report on Public Works; Report of Hydro-Electric Power Commission.* (J. C. HE[illegible])

New Deal: *see* BUDGETS, NATIONAL; SOCIAL SECURITY; UNITED STATES: *History.*

New Education Fellowship: *see* EDUCATION, PROGRESSIVE.

Newfoundland and Labrador. Area: Newfoundland 42,000 sq.mi.; Labrador 110,000 sq.mi.; total 152,000 sq.mi.; pop. (est. Dec. 1938): Newfoundland 290,660; Labrador 4,780. Chief town (capital, pop. est. 1938): St. John's (41,000). Governor: Humphrey Walwyn; language: English; religion (1935 census): Roman Catholic 93,925; Church of England 92,732; United Church 76,100; Salvation Army 18,054.

History.—The island of Newfoundland off the east coast of Canada, which has sovereignty over the mainland area of Labrador, is a British dominion with its government as such in suspension since 1933. It is administered by a commission of government instituted by the imperial government.

The reconstruction program outlined by J. H. Penson, the commissioner for finance, in July 1939 was much curtailed on account of the war and the resulting substantial reduction in expenditure coupled with the increased taxation put the finances of the country on a firmer footing and not only relieved it of the necessity of calling on the mother country to meet the annual deficit but enabled it to make large contributions to the empire's war effort, including the provision of funds for fighter aircraft. A war loan of $1,500,000 at 3¼% redeemable in 25 years was issued at par in June and almost immediately oversubscribed, and in addition to such financial help Newfoundland provided a constant flow of volunteers for all branches of the fighting services and for logging. Two regiments of royal artillery were formed, some 3,000 trawlermen—with a number of trappers—joined the navy, mainly for minesweeping, and 500 the mercantile marine; and over 2,500 lumberjacks worked for the ministry of supply in the state forests of England, Scotland and Wales.

In conformity with the proposal announced by Mr. Churchill in the house of commons on Aug. 20 to lease to the United States sites for naval and air bases for the defence of the U.S. Atlantic seaboard, facilities for the establishment of such bases on the south coast and the Avalon peninsula were granted, and in November work was begun on the first of these, in Placentia bay.

It was announced in July that the term of the governor, who was due to expire in Jan. 1941, had been extended for a year.

Banking and Finance.—Revenue, ordinary, 1939–40 (actual) $11,641,700, 1940–41 (est.) $13,400,000; expenditure, 1939–40 (actual) $19,249,640, 1940–41 (est.) $15,548,000, including $1,532,000 for special reconstruction work; public debt (June 30, 1939) sterling £20,382,869; notes in circulation (June 30, 1939) $24,023; exchange rate as Canadian dollar.

New Guinea: *see* DUTCH EAST INDIES; MANDATES; PACIFIC ISLANDS, MANDATED.

New Hampshire, one of the New England group of states and one of the original states of the United

es, popularly known as the "Granite State"; area, 9,282 i.; population (U.S. census 1940) 491,524, representing an in-se of 26,231 or 5·6% over population in 1930. Capital, Con-, 27,171. Other cities with populations exceeding 15,000: nchester, 77,685; ıua, 32,927; Berlin, 84. Of the state's ılation 283,225 or % are urban. In there were 464,350 es, of which 381,690 native born and 50, foreign born. Im-ant foreign-born ele-ts were: United dom, 11,539; French ıdians, 37,682; other ıdians, 13,277. Dur-he decade from 1930 940 New Hampshire's population grew r than the urban, sing the trend from to 1930.

ROBERT O. BLOOD was elected Republican governor of New Hampshire Nov. 5, 1940

istory. — Governor, rt O. Blood (elected in Nov. 1940); secretary of state, h D. Fuller; state treasurer, F. Gordon Kimball; commis-general, Charles F. Bowen; attorney general, Frank R. son (all Republican). U.S. Senators from New Hampshire H. Styles Bridges and Charles W. Tobey (both Republican). gressmen were Arthur B. Jenks and Foster Stearns (Repub-). In the general court in 1941 were 12 Republican senators, mocratic, and 3 elected by both parties. The house of repre-ıtives included 229 Republicans and 194 Democrats. While state government was controlled by Republicans as a result he election of 1940, yet New Hampshire was carried for evelt by a popular vote of 125,292 as compared with 110,127 Vendell L. Willkie. The general court convened for its 163rd on on Jan. 1, 1941. During the year 1940 the state supreme t by a vote of 3 to 2, held constitutional the sales tax on cco levied by the legislature at its last session, thus marking ft in the opinion of the court regarding the taxation of single nodities. The revenue from this tax made it unnecessary to ct any state property tax. During 1940 the state completed a flood control and conservation project on the Connecticut at Pittsburg, while the war department began the construc-of flood control projects at Surry mountain on the Ashuelot , at Webster on the Blackwater river, and at Franklin Falls ıe Pemigewasset.

lucation.—Data available show that there were in New ıpshire some 1,941 public schools, including 103 approved ic high schools; 16 public academies approved as high ols; 5 accredited private academies; 612 private schools; and ıchers' colleges, at Plymouth and Keene. There were also five tutions of higher education: University of New Hampshire, ıam; Dartmouth college, Hanover; St. Anselm's college, chester; Colby Junior College for Women, New London; and ın Junior College at Tilton. There were in 1939 some 198 nile camps licensed by the state board of health. Total state nditures for public education, year ending June 30, 1939, 47,642. Data made available by the state board of education a total of 82,933 public and state school pupils and 32,950 ate school pupils, with a total of 115,833 enrolled in all edu-ınal institutions. In 1938 there were approximately 21,000 ls enrolled in elementary parochial schools.

Banking and Finance.—Savings banks and savings departments of trust companies reported deposits of $205,579,479, as of June 30, 1940, being an increase over June 30, 1939, of $1,115,064. There were also 27 building and loan associations with resources of $12,543,567, an increase of $573,113 over 1939. Cash receipts of state treasury department, for fiscal year ending June 30, 1939, $38,502,796; cash disbursements, $39,302,215. Net total bond and note and temporary loan debt, June 30, 1939, $10,328,744. Action taken by the legislature in 1937 and 1939 with respect to a debt reorganization plan for financing, is resulting in an orderly procedure for funded debt retirement.

Agriculture, Manufactures, Mineral Production.—Major farm products are milk and cream, potatoes, apples, dairy cattle and live poultry, marketed principally in cities of eastern and central Massachusetts and New York city. Estimated acreage in 1934, used for crops, 448,000; for pasture, 961,000; woodland, 1,274,000. Lumber production, 1937, estimated at 157,000,000 board feet. A supply of white pine lumber rendered available as a result of the hurricane of 1938 and estimated at 500,000,000 board feet, was salvaged. Number of farms, 1935, 17,695 with average acreage of 119·6; average value per acre, $31.64. Industries of New Hampshire are marked by their diversity and by the relatively large proportion of small-sized plants. They produce textiles, boots and shoes, paper and pulp, a variety of wood products and machinery. Value of manufactures in 1937, $249,631,-724. Electric power generated in 1938, in kilowatt hours: water power 696,000,000; steam, 37,000,000; internal combustion, 1,000,000. In 1936 it was estimated that the recreation "business" produced a direct gross income of $9,641,503. An important report was submitted in 1939 to the Commissioner for the Promotion of the Wealth and Income of the People of New Hampshire, which found that in 1936, of the total state income, 51·5% came from manufacturing; 19·6% from service; 13·6% from trade and finance; 9·9% from transportation and communication; and 5·4% from agriculture. The New Hampshire State Planning and Development commission, with headquarters at Concord, from time to time issues valuable reports on agriculture, industry and natural resources, which may be secured through Frederick P. Clark, planning director. (W. E. Ss.)

New Hebrides: *see* PACIFIC ISLANDS, BRITISH; FRENCH COLONIAL EMPIRE.

New Jersey, described as the "Garden State," was one of the original states of the United States and is on the Atlantic coast; area 8,224·44 sq.mi.; population according to U.S. census of 1940, 4,160,165; capital, Trenton, 124,697. The largest city is Newark, population 429,760. It ranks 18th in population of 100,000 or more. The state's population a decade ago was 4,041,334. The ten-year increase was 2·9%. Declining urban populations were noted in the 1940 census returns. Of the six cities having a population in excess of 100,000, only two, Paterson and Trenton, showed increases. Elizabeth had the largest decrease, from 114,589 in 1930 to 109,912 in 1940.

History.—In the 1940 election New Jersey polled 2,019,406 votes out of a total registration of 2,361,080. It was the highest vote in the state's history and the returns again reflected the refusal of the electorate to cast straight party tickets. President Roosevelt received 1,016,404 votes and Willkie 944,876. Charles Edison, formerly secretary of the navy, was elected governor over State Senator Robert C. Hendrickson, his Republican opponent, by 63,875. But W. Warren Barbour, running for a full six-year term in the United States senate, was elected over the Democratic nominee, James H. R. Cromwell, by 205,438.

Further evidence of the discriminating voting habits of New

Jersey was supplied by the legislative results. While Roosevelt and Edison were sweeping the state, the Republican party rolled up a majority of 79,979 on the basis of the average assembly vote. Accordingly the Republicans retained control of the assembly by a majority of 41 to 19 and of the senate by a majority of 16 to 5. Their candidate for governor, Mr. Hendrickson, polled 100,000 more votes than any winning governor the state has had.

President Roosevelt's majority fell sharply below his 1936 total of 364,128, although he polled only 67,145 fewer votes. This decline is accounted for by the fact that Wendell L. Willkie, who had made two stumping tours of the state, received 944,876 votes whereas Alfred M. Landon in 1936 had polled only 719,876.

CHARLES EDISON, former secretary of the navy, was elected governor of New Jersey Nov. 5, 1940, on the Democratic ticket

The election was preceded by a Republican drive against the Hudson county organization of Mayor Frank Hague of Jersey City. The legislature tried to compel the installation of voting machines in Hudson but was unsuccessful. In response to Republican complaints against Hudson's election practices, the committee on campaign expenditures of the United States senate assigned investigators to Hudson county. Fraud had been charged in the 1937 gubernatorial election and, as the inquiry started, it was disclosed that Jersey City's poll books had been burned early in 1940. Republican candidates and managers contended the destruction of the records corroborated their allegations. Jersey City authorities maintained the burning of the poll books was legal, inasmuch as the law required only that they be preserved for two years. The Republican legislature likewise reorganized the election bureaus in Hudson and Essex counties and installed new superintendents in each. Nevertheless the Hague organization carried Hudson for Roosevelt and Edison by majorities of 100,000. In the 1936 election President Roosevelt's majority in Hudson was 163,000.

Mayor Hague and his organization were objects of Republican attack throughout the year. Senator Hendrickson had won the gubernatorial nomination in the May primary from former Governor Harold G. Hoffman after describing him as a political partner of the Democratic leader in bi-partisan trades in preceding legislatures. Senator Barbour, elected to the United States senate in 1936 for the unexpired term of Governor A. Harry Moore, was unopposed for the Republican nomination. Mayor Hague countered Republican attacks by early announcing his support of Governor Edison and of Candidate Cromwell. When the campaign began to accelerate, however, both remained aloof from the Democratic leader and said that if elected they would not "take orders."

The 1940 legislature, following the example of its immediate predecessors, again remained in session from January to January to reinforce its claim of meeting longer than any legislative body in the country.

Finance.—The net value of real and personal property, subject to taxation, in 1939 was $5,617,803,676. That was a decrease from 1938 of $50,074,037. These ratables are made up as follows: real estate, exclusive of second-class railroad property, $4,73 635,309; second-class railroad property, $196,608,382; perso property, exclusive of bank stock, $747,543,180. The average rate for 1939 was $4.620 per $100 of valuation. Real estate a personal property specifically exempted from taxation for 1 amounted to $1,076,667,563, comprising mainly schools, church cemeteries, public and charitable properties.

Agriculture and Manufacturing.—Gross income of New J sey farmers for 1939 was $105,848,000. This was an increase $3,632,000 over 1938. The figures include income from mark ing and government payments.

For agricultural statistics *see* ALFALFA; APPLES; BARLE BUCKWHEAT; CORN; FARM MACHINERY; GRAPES; HAY; OA PEACHES; PEARS; POTATOES; SWEET POTATOES; WHEAT.

The diversified character of New Jersey's industries was de onstrated by the large amount of defence contracts placed by United States government. A month before the end of 1940 th contracts ran to $1,121,732,669. The figures for naval contra totalled $796,506,028 and for the army $325,226,641.

(A. J. S.)

New Mexico, the fourth largest state in the southwest United States, popularly known as the "S shine State"; area, 122,634 sq.mi.; population according to U.S. census of 1940, 531,818. Capital, Santa Fe, 20,325. Al querque is the only larger city, 35,449. Of the state's populat 176,401 are urban, or 33·2%.

History.—The administration, legislature and congressio representation of New Mexico is Democratic. The chief offic of state elected for two years were: governor, John E. Miles (elected); lieut. gov., Ceferino Quintana; secretary of state, Je M. Gonzales; auditor, E. D. Trujillo; treasurer, Rex French; torney general, Edward P. Chase; superintendent of public struction, Grace J. Corrigan; commissioner of public lands, H. Rodgers. The national representatives are Senator Carl A. Ha Senator Dennis Chavez and Representative Clinton P. Anders In the presidential election Roosevelt received 103,699 votes against Willkie's 79,615.

Education.—For the school year 1937–38 public schools c $9,001,045 for 129,877 children. The state also supports University of New Mexico, College of Agriculture and Mecha Arts, Normal university, School of Mines, Normal school, E ern New Mexico Junior college, Spanish American Normal sch and the Military institute.

Charities and Correction.—State charitable institutions a School for the Deaf, School for the Blind, Home and Train School for Mental Defectives, Industrial school, Girls' Welf school, Insane Asylum, Miners hospital, penitentiary and Carrie Tingley Crippled Children's hospital.

Banking and Finance.—On June 30, 1940 there were 41 ba with total deposits of $60,148,000. The assessed valuation of N Mexico is $312,945,873. Total state revenue receipts for fiscal year ending June 30, 1940 were $23,903,614.70. A 5-c gasoline tax yielded $4,975,038.88; a 2% sales tax, $3,890,846. and a 5.625 mills general property tax, $2,152,284.65. An e mated $80,000,000 was spent by tourists.

Agriculture and Mineral Production.—The leading f products were: gr. sorghums, 3,150,000 bu.; wheat, 1,720,000 corn, 2,376,000 bu.; beans, 656,000 bags; cotton, 123,000 ba In 1939 there were 1,276,000 head of cattle, worth $45,085. and 2,433,000 sheep worth $14,025,000.

Mineral production for 1940: copper, $16,241,264; zinc, 860,220; gold, $1,378,090.

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(F. D. R

ew South Wales. A state of the Australian commonwealth, lying in the southeast and oc- pying 309,432 sq.mi.; pop. (est. March 31, 1940) 2,775,871. ief towns (pop. est. Dec. 31, 1939): Sydney, capital (1,302,-0); Newcastle (117,050). The state governor is Capt. the Rt. n. Lord Wakehurst, K.C.M.G.

History.—The Labour party which forms the opposition in state legislature suffered from internecine strife during 1940. April Mr. Lang, ex-leader of the party and former state pre- er, was joined by several state and federal members in the mation of a new Labour party to be known as the Australian bour party (non-communist). In August all the officials and cutives of the state A.L.P. were suspended by the federal cutive. The state parliamentary Labour party at a special eting endorsed the action of the federal executive and a num- of the suspended state officials formed a third labour group, "Australian Labour Party, State of New South Wales." All ee groups submitted candidates for the senate and for a num- of N.S.W. seats in the house of representatives at the general ction in September. A total of 21 candidates offered themselves the three vacant senate seats and 135 candidates contested 28 electorates for the house of representatives. Of the four nbers of the non-communist group who sought re-election, ee were successful and one lost his seat to the official labour didate. The party representing the deposed N.S.W. executive eived little support.

A general strike of coal miners which lasted from March 8 il May 16 caused a temporary diminution of output in a nber of the heavy industries. Over the whole year, however, rgely increased output from factories engaged in war pro- tion was recorded. A number of new industrial enterprises e established. The new plant at Port Kembla for the manu- ure of high quality steel sheets came into production early in o and was turning out 36,000 tons a year.

H.M.A.S. "Warrego" an escort ship was launched at Cockatoo nd, Sydney, in February and the keels of two further naval sels were laid immediately after the ceremony.

The state parliament introduced bills to enable solicitors on service to maintain their practices and to enable soldiers er 21 to make wills. State accounts resulted in a deficit of 00,000 compared with an estimated deficit of £1,500,000.

Dr. Michael Kelly, the Roman Catholic archbishop of Sydney the world's oldest prelate, died on March 8 at the age of 90.

ducation.—In 1939: public schools 3,285; teachers 13,047; olars on roll 363,134; average attendance 294,628; expendi- e by state £A4,960,000.

inance.—In 1938–39: revenue £A51,710,000; expenditure 4,163,000; debt outstanding (June 30, 1939) £A359,878,000.

Communication.—Roads (March 30, 1937) 46,108 mi. fit for or traffic. Railways, government (June 1939) 6,141 mi. mways (June 1939) 189 mi. Motor vehicles licensed (June 1940): cars 209,510; commercial vehicles 83,928; cycles 52; buses 823; taxicabs 1,355. Wireless receiving set licences ne 1940) 458,155. Telephones (June 1939): exchanges 2,004; ruments connected 257,246.

Agriculture and Mineral Production.—Production in 1939– wheat 76,551,000 bu.; butter 112,020,000 lb.; wool greasy ,000,000 lb.; maize 2,900,000 bu.; coal (1939) 11,196,000 s; gold (1939) 87,189 fine oz. Industry and labour: average nber of employees in factories (1939–40) 233,000; employ- nt (April 1940) 94·0%. (W. D. Ma.)

wspapers. Three extraordinary news tasks tested the enterprise of newspapers in the United States in o. They were: the rapidly expanding European war; the presidential campaign and election; and the draft lottery of the first U.S. peacetime selective service act. In greater detail, these activities may be recorded thus:

Although costing millions of dollars and taxing the co-operative efforts of U.S. newspapers and their press associations, the European war story was laid before the public, even of the smallest hamlets, with increasing detail and accuracy, during the late months of 1939 and the early part of 1940. Suddenly, on May 10, when Hitler began his invasion of Holland, Belgium and France, the news situation changed; his armies swept out before them much of the U.S. news machine. What remained was forced to operate under the censorship, controlled communications and other restrictions set up by the propaganda agency of a conquering dictator. During the last half of 1940 most of the news of continental Europe cleared through Berlin, Rome and half-free Vichy, France. Only in Britain and in various free lands on the fringes of conquest could the U.S. news man operate freely; most of his former news centres were deserted. But by gathering information where he could, by balancing official communiqué against communiqué, by carefully recording the effect of censorship and propaganda on his dispatches, the U.S. correspondent continued to keep his public informed in a way that no other nation, not even the British, was informed. Only rough estimates of the cost of the coverage were available, but both the Associated Press and the United Press reported their European costs close to $1,000,000 over normal and much greater than at any period in the war of 1914–18. A daily cable file of 25,000 words and a daily cost of $5,000 for cable and wireless were not unusual.

The extended and whirlwind presidential campaign of Wendell L. Willkie, Republican candidate, including not only many prepared speeches but an almost hourly bombardment of extemporaneous talks, was recorded by the political reporters as one of the most difficult campaigns U.S. newspapers had ever reported. Near the end of the campaign, when both candidates spoke almost daily, they threatened to swamp news wires and newspaper space. But, however much their editorial pages were criticized for supporting the losing candidate, the news men reported both sides with such thoroughness that few front pages failed to record every important utterance of both candidates. At the end, on Nov. 5, newspapers threw their entire personnel and facilities into tabulating the 50,000,000 ballots with such speed that President Roosevelt's victory was announced by 10 P.M.—meanwhile, they co-operated fully with the radio in spreading the news before the public.

Because of the controversy over the proportion of the daily press that opposed President Roosevelt, the *Editor & Publisher* tabulated the first authentic survey, based on individual questionnaires, of the editorial-page preferences of daily newspapers in the campaigns of 1940, 1936 and 1932. Late in Oct. 1940, returns from 1,273 daily newspapers showed 289, or 22%, editorially favouring President Roosevelt; 813, or 63%, favouring Willkie; and 171, or 13%, expressing no preference. An effort to evaluate the support on the basis of total circulation slightly reduced Willkie's percentage and increased Roosevelt's. The same returns reported 1936 editorial-page leanings as follows: 459 newspapers, or 36%, supporting Roosevelt; 727, or 57%, supporting Landon; and 87, or 6%, neutral. For the 1932 campaign, the same newspapers reported: 511, or 40%, supported Roosevelt; 656, or 52%, supported Hoover; and 94, or 7%, were neutral. As the number of newspapers reporting represented only about two-thirds of the daily press, the survey noted that most of those failing to report were smaller dailies or southern dailies.

The selective service draft brought an unexpectedly costly news task. In even the smallest community newspaper, there was first

"HELL'S CORNER" on the cliffs of Dover, England in 1940. Here reporters and photographers kept a constant watch for German aircraft approaching from France and for a possible German invasion

the duty of assisting local draft boards in assembling, arranging, and publishing the lists of local draft numbers—a task that in many cases occupied the entire personnel of the newspaper and resulted in large costs. When the lottery affecting 17,000,000 men was held in Washington on Oct. 29, the press association wires devoted 17½ hours to carrying the 9,000 lottery numbers to their newspaper clients. Then the news rooms again re-sorted the names, correlated them with local lists, and published many pages of names and numbers. Their reward was a temporary circulation gain ranging as high as 25%.

The annual listing of the ten biggest stories of the year by the three press associations evidenced the completeness with which war eclipsed all other news in the amount of newspaper space. The United Press listed the biggest stories as: (1) President Roosevelt's re-election for a third term and preliminary developments including the sensational rise of Wendell Willkie; (2) Battle of Britain which represents history's first big-scale air war; (3) Fall of France with resulting British evacuation of Dunkirk and battle of Oran; (4) United States selective service and other measures of national defence including the destroyers-for-naval-bases deal; (5) German occupancy of Norway, Denmark and the Low Countries; (6) Berlin-Rome-Tokyo axis and Japanese thrust into Indo-China; (7) Italy's attempt to invade Greece; (8) Germany's diplomatic offensive into the Balkans with abdication of Rumanian King Carol; (9) Italy's entrance into the war; (10) The enigma of Russia. The lists of the Associated Press and the International News service were practically identical, although one added Pan-American negotiations.

Partly because of the war, the annual survey showed morning newspaper circulations up 4·99% and evening circulations up 4·56% over 1939, reaching a grand total of 46,579,892 newspapers sold daily. Sunday circulations went up 3·16%, reaching a total of 22,876,878. Because of the small number of mergings and suspensions, *Ayer's Directory* reported virtually no net change in the number of dailies, the total remaining 2,015.

The most interesting new newspapers launched were the *New York PM,* illustrated daily news-magazine, which appeared on June 18 and continued through the year, although refinanced in November, and the similar *Hartford* (Conn.) *Newdaily*, which began on March 4 and lasted 89 issues. The most striking newspaper death was that of the Paris edition of the *New York Herald Tribune* in June, after 54 years of publication.

The first newsprint from southern pine was marketed by the Southland Paper Mills of Lufkin, Tex., on Jan. 17. The first N tional Newspaper Week was celebrated in 5,000 cities and tow Oct. 1–7. Two newspapers faced sensational contempt of co charges which were still before supreme courts at the end of t year—the *St. Louis Post-Dispatch* and the *Los Angeles Tim* both charged with criticizing pending litigation. The long Newspaper Guild strike, against the *Chicago Herald-Americ* ended in April after 17 months. The Guild met at Memphis, f into argument over communistic influence, and elected two n presidents—first Kenneth G. Crawford, Washington, D.C., January, then Donal M. Sullivan, Boston, in July—succeeding t late Heywood Broun. Most publishers' meetings were concern with the Federal Wage-Hour law, and newspapers obtained Oct. 24 a ruling which defined newsroom "professionals" exem from overtime. New data on reading habits were lear through the Continuing Study of Newspaper Reading which the end of the year had analyzed 24 newspapers for the Adv tising Research foundation.

Notable deaths in the newspaper world were: Frederick Murphy, publisher of the *Minneapolis Tribune;* Dr. John H. F ley, editor emeritus of the *New York Times;* Frederick C. Fa banks, publisher of the *Indianapolis News*; Robert Findlay Pai Scripps-Howard editor; Webb Miller, European news manager the United Press, killed in England and Ralph W. Barnes, *N York Herald Tribune* correspondent, killed in a British bomb crash in Yugoslavia. (G. M. Hy.)

Great Britain.—The price of newsprint stood at £11.5*s.* at t outbreak of war, and before the close of 1940 had risen by o 150% to £28.10*s.* (plus extras); cost of other materials, of tra port and of labour had also mounted—though not so steep and though the effects were partly offset by rationing, newsp proprietors were obliged to take other steps, such as the narr ing of columns to allow of more matter to the page, rises advertising rates, discontinuance of canvassing and free insura etc. About 40 provincial papers raised their selling price fr 1*d.* to 1½*d.*, a dozen or more suspended or ceased publication, there were amalgamations in Great Yarmouth, Clacton, Sheern Barnsley and a few other small towns.

Compulsory rationing of paper culminated in July in an or fixing the maximum number of pages, 2*d.* dailies (the *Times* sole survivor) being limited to 60pp. weekly, large 1*d.* dailies 36pp., and "tabloids" to 72pp. The effect of all this on the p lic was slight, for in September it was reported that sales w down by only 5%.

Other difficulties with which the industry had to contend

ded the control—severe, arbitrary, spasmodic and uneven—rcised by the ministry of information, the censorship and the vice authorities; and, in the second half of the year, the zkrieg. In London the buildings and plant of both the *Times* l the *Daily Sketch* suffered severely from German bombs, and efficient distribution system became on occasion seriously organized; but it was the proud and legitimate boast of Fleet eet that no issue of any daily or Sunday paper was frustrated l that delay in delivery was negligible—a matter of a few urs at even the farthest point.

Among notable events during 1940 were the celebration in ndon (March) of the 30th anniversary of the Empire Press on, and of the jubilee (Feb.–Mar.) of the reception by the stitute of Journalists of their royal charter; also the transence of part of the printing of the *Sunday Times* and *Sunday aphic* to Manchester (Sept.), and, in the same city, the inguration of a northern edition of the *Daily Telegraph. France,* paper for free Frenchmen and the first French daily to be blished in England, made its appearance. Journalism had to urn the loss, among others, of Herbert Sidebotham (March), "Scrutator" of the *Sunday Times,* a former *Manchester ardian* and *Times* man; in July of Robert Dell, for many rs correspondent in Paris and Geneva for the *Manchester ardian* and one of the best known English journalists on the tinent; of James Douglas (Sept. 26), one-time editor first the *Star* and later of the *Daily Express;* and of Robert Keir ov. 3), for many years London editor of the *Liverpool Daily st.* (*See* also ADVERTISING; PRINTING.) (L. H. D.)

wton, Alfred Edward (1863–1940), U.S. manufacturer and author, was born in ladelphia on Aug. 26. He was a clerk in a book store at the of 15 and was employed in various occupations until he ame engaged in the manufacture of electrical equipment in o. In the course of time he developed an interest in first edins of notable books and became one of the best known collecs in the United States with a library of 10,000 volumes, inding a first folio edition of Shakespeare and firsts of Dickens l many others. In 1918 he wrote an article for *The Atlantic nthly* which he later expanded into a book, *The Amenities of ok-Collecting and Kindred Affections.* The first edition is a ector's item. He wrote several other books, including a play the life of Samuel Johnson. He was elected president of the nson society in England, the first American to hold the office. died in Philadelphia, Sept. 29.

w York, one of the 13 original states of the Union, popularly known as the "Empire state," covers an a of 49,204 sq.mi., of which 1,550 sq.mi. are water. In 1940 the pulation, according to the preliminary figures of the census, 13,479,142. The foreign born, according to the census of o, numbered 3,191,549; Negroes, 412,814; and other nontes, 24,959. The capital is Albany, with a population in 1940 130,577. Other principal cities are New York, with a population of 7,454,995; Buffalo, 575,901; Rochester, 324,975; Syrae, 205,967; Yonkers, 142,598; Utica, 100,518; Binghamton, 309; Troy, 70,304. Of these cities, Albany, Binghamton, falo, New York, and Yonkers (which is a suburb of New rk) gained in population since 1930, and Rochester, Syracuse, y and Utica lost. Among the great cities of the world, New rk ranks next to London.

History.—At the election on Nov. 5, 1940, Roosevelt (3,251,-), with the aid of 417,418 votes of the American Labor party, the state electoral vote. The straight Republican vote for ndell Willkie (3,027,478), however, was 192,978 greater than the straight Democratic vote for Mr. Roosevelt. James M. Mead, Democrat, was re-elected to the United States senate. Three vacancies on the bench of the court of appeals were filled by the election of Edmund J. Lewis and Albert Conway, who had the endorsement of the Republican, Democratic and American Labor parties, and C. S. Desmond, supported by the Democrats against a Republican opponent. The Republicans retained control of both houses of the legislature, making a gain of three seats in the senate and a net gain of two seats in the assembly, giving them 30 of the 51 senators and 87 of the 150 assemblymen.

The legislature, acting under the authority of a constitutional amendment ratified by the people in 1939, passed an act authorizing pari-mutuel betting at race tracks. It provided that the minimum admission fee to a race track should be $1.50 and that the state and the track owners should share equally in 10% of the amount bet on the races. The first race under the new law was at the Jamaica track on April 15 when the total amount bet on the different races was $821,946. Amendments modifying the judiciary article of the constitution and permitting the collection of tolls on the Erie canal were rejected. A budget of $391,600,000 and a supplementary budget of $1,791,000 were approved. The legislature rejected a bill providing for the erection of a state-owned electric power plant to be used as a "yardstick" for fixing rates to be charged by privately owned corporations. It also rejected two bills intended to give New York city control over the salaries of county employees and court attachés, as well as a bill to permit the retirement of mentally incapacitated school teachers. The increase within 15 years by 3,000 in the number of patients in the state hospitals for the mentally ill, with the consequent increase in the cost of maintenance, attracted the attention of the governor, and he appointed a committee of 11 to study means of reducing the number of patients and improving methods of treatment, a greater use of the parole system and the advisability of outside care with payment of board to those caring for the unfortunates. The governor also, acting under authority of a law passed in 1917, ordered the attorney general to make an exhaustive inquiry into all subversive activities within the state and directed all other public officials and their subordinates to cooperate in the investigation. Scandals arising from the award of state printing contracts led the governor to appoint a commission to make an investigation. The Public Service commission began to carry out a program for 68 railroad grade crossing projects, including the elimination of 148 separate crossings.

The principal officers of the state in 1940 were: governor, Herbert H. Lehman, Democrat; lieutenant governor, Charles Poletti; attorney general, John J. Bennett; commissioner of education, Ernest E. Cole; secretary of state, Michael F. Walsh; commissioner of corrections, Edward S. Mulrooney; superintendent of banking, William P. White.

Education.—According to the statistics for 1940 there were in the state 10,300 public schools with a total registration of 2,244,-134 pupils, instructed by 82,349 teachers. There were 980 high schools with a registration of 738,542 pupils, taught by 25,999 teachers. The cost of supporting the schools was $347,775,704.30 of which $123,885,607.76 was paid by the state. In addition to the public schools there were 86 colleges and universities in the state. The Board of Regents of the University of the State of New York has general supervision over the public schools. Frank P. Graves, chancellor of the university and commissioner of education, retired in June. He had reached the age limit after serving 19 years. The regents elected Deputy Commissioner Ernest E. Cole as his successor.

Correction.—On June 30, 1940 there were 14 institutions under the direction of the department of correction with a total population of 18,196. On that date there were 2,797 inmates in

Sing Sing prison; 2,266 in Attica prison; 2,147 in Clinton prison; 1,702 in Auburn prison and 1,501 in Great Meadow prison. The cost of maintaining the 14 correctional institutions for the fiscal year ending June 30 was $9,582,705.35, or $526.54 per capita.

Banking.—There were in the state on June 30, 1940, 1,223 financial institutions incorporated under the banking laws or under the supervision of the banking department. Included in this number were 128 state banks, 162 trust companies, 15 industrial banks, 8 private banks and 134 mutual savings banks. The total deposits in all these institutions on that date were $17,922,632,672, credited to 11,078,816 depositors. The total capital was $670,759,510 and the total resources were $21,385,047,880. Included in the institutions reporting to the banking department were 201 savings and loan associations with resources of $263,549,899 on Jan. 1, 1940, of which $243,510,499 was due to shareholders. In 1939, in addition to the banks under state control, there were 427 national banks with a capital of $281,936,000, deposits of $6,226,339,000 and assets of $7,120,224,000.

Wealth and Income.—The assessed valuation of taxable real estate in the state according to the latest figures was $25,687,333,739, which under the system of assessments represents a value of $30,023,075,771. The total income of the people of the state is estimated at $10,440,000,000. According to the latest federal farm census there were then 177,025 farms with a total acreage of 18,185,741. The land and buildings were valued at $1,045,391,981 and the livestock was worth $222,250,942. The farm population was 784,483, which included 21,113 tenant farmers and 124,206 who owned their land. In 1939, 16,113 stock companies were chartered, or 438 more than in the previous year. Of them 4,608 were to engage in real estate transactions; 7,430 had a total capitalization of $179,512,376, while the others issued stock with no par value, and 14,239 of the corporations had their headquarters in New York city. The state had a gross bonded debt of $671,731,000. Included in it were $233,500,000 sinking fund bonds and $438,231,000 serial bonds. The sinking fund contained $145,947,430, which reduced the gross debt to a net debt of $525,783,570. (G. W. Do.)

New York City.

The city council, elected for the second time under the proportional representation system, met in January with 14 Democratic members, two American Labor party, two Fusionists, one Republican and one Independent. At the November election a proposal to abandon the proportional representation system was rejected by the voters. President Roosevelt and United States Senator Mead, both Democrats, carried the city, and Democratic candidates for several local offices were elected. The efforts of the Bar association and the Citizens union to bring about the election of qualified judges were successful, for 18 of the 20 victorious judicial candidates had been endorsed in advance by these organizations.

Although the population of the city has increased, the enrolment in the public schools has been decreasing since 1936. In that year the enrolment was 1,121,084, and in 1940 it was 1,093,683. Yet during 1940 ten new school houses were completed at a cost of $13,887,363, of which $602,373 was contributed by the Work Projects administration. The board of education, acting under authority of a law passed by the legislature, voted to release pupils from the schools for one hour every Wednesday afternoon so that they might receive religious instruction from such teachers as their parents might select. The school budget for the year called for $158,000,000 with a supplemental estimate of $11,000,000 if the money could be found. A legislative committee inquiring into subversive activities in the schools found that some teachers and many pupils were working with the communists.

The socialization of transportation in the city began many years ago when subways were built at public expense and leased to operating companies. In 1921 the city set out on a program looking to the ownership and operation of the surface and elevated lines as well as the subways. The plan was consummated in the summer of 1940 when the city completed the purchase of the privately owned subway and elevated lines and part of the surface lines in Brooklyn and rejected a proposal for the incorporation of a company to operate the whole transportation system. As a result the employees, numbering about 29,000, became employees of the city subject to civil service regulations. The cost of the system, to date, according to the Citizens Budget commission, is $1,432,000,000.

In pursuit of the policy to get rid of the elevated railroads a subway under Sixth ave. was opened on Dec. 14, to take the place of the demolished elevated road in that street. In order to facilitate traffic movement among the different sections of the city, bridges and tunnels have been built. The latest tunnel to be completed connects midtown Manhattan with Long Island City under the East river. It was opened to the public on Nov. 15. Another tunnel, which has been talked about for many years, is to connect the Battery in Manhattan with Hamilton ave. in Brooklyn. President Roosevelt broke ground for it on Oct. 2. Its estimated cost is $81,000,000. A borough hall for the accommodation of the officials was built in the borough of Queens.

Following the passage five years ago of a law permitting the opening of places of amusement on Sunday, the moving picture theatres, vaudeville and burlesque shows were open on that day, but because the actors demanded double pay for Sunday appearances the legitimate theatres remained closed. In November, however, the actors' association withdrew the demand for extra pay, and on the first Sunday 11 of the 19 theatres in operation opened their doors to the public.

An investigation into the charge of collusive bidding for city printing led to the presentation to the grand jury in New York county of the case against the printers. The investigators recommended that the city establish a printing plant of its own and estimated that it would result in a saving of $250,000 a year. (*See* also MUNICIPAL GOVERNMENT.) (G. W. Do.)

New York University.

Supplementing traditional disciplines in the humanities, the university in 1940 extended the offering of its co-educational liberal arts college at Washington Square to include combination four-year arts-radio, arts-medical technology and arts-government courses. These programs, leading to the baccalaureate, provide an interweaving of cultural and technical training. Similarly, a six-year combination program for liberal arts and engineering students who may seek the advantages of training in both fields was instituted at the University Heights centre. Several special courses keyed to national defence activities were introduced, chiefly in engineering, and the program of student aeroplane pilot training in collaboration with the Civil Aeronautics authority, was enlarged.

Gifts received by the university approximated $500,000, with medical research the principal beneficiary. The university's total assets were valued at some $27,500,000, and the operating budget for the year 1939–40 was $9,141,299.98. The student enrolment totalled 45,777, and the faculty 2,192. June 1940 marked the largest commencement of the institution, with 4,967 graduates receiving degrees and certificates. (H. W. CH.)

New York World's Fair: *see* ARCHITECTURE; ART GALLERIES AND ART MUSEUMS; ELECTRIC LIGHTING; FAIRS, EXHIBITIONS, EXPOSITIONS.

w Zealand, Dominion of. A British dominion, consisting of a group of islands g in the south Pacific between 34° 25′ and 47° 17′ S., and been 166° 26′ and 178° 36′ E. Area: Dominion proper, 103,415 mi.; other islands, 519 sq.mi.; pop.: Dominion proper (est. rch 31, 1940), 1,640,901 (Maoris 90,980); Cook and other cific islands (census 1936), 16,350. Chief towns (pop. est. ril 1, 1939): Auckland (221,500); Wellington (cap. 157,900); ristchurch (135,400); Dunedin (82,800). Ruler: King George ; governor general (elect): Air Marshal Sir Cyril Newall, M.; language: English; religion: Christian (1936 figures, exding Maoris: Church of England 600,786; Presbyterian 367,-; Roman Catholic 195,261; Methodist 121,012).

History.—Events in New Zealand during 1940 were largely trolled by the progress of the war. During the European ter of 1939–40, when little hint was given of the great events come, some interest was maintained in local politics, while ebrations of the dominion's centenary were nationwide. The reation of the appointment of J. A. Lee as parliamentary underretary to the minister of finance brought into the open an ernal division in the Labour party which had caused the prime nister, M. J. Savage, much worry for some time. Mr. Lee's ion in writing a magazine article criticizing his leader, who was n ill, led to his expulsion from the Labour party. Later, W. E. nard, speaker of the house of representatives, resigned from party but retained his seat in parliament. Both men held that government had failed to implement the full labour program, re especially in their attitude to the trading banks and the use reserve bank credit. Their left-wing movement had some supt in the country, but not enough seriously to endanger the ernment's position. The inclusion of a member of the left up, Dr. D. G. McMillan, in the cabinet helped to placate that ion of the movement.

'he death of Mr. Savage on March 26, 1940 was the occasion a great demonstration of public grief. Peter Fraser, the new ne minister, had achieved outstanding success as minister of cation. His capacity for leadership was soon tested when the asion of the low countries and the rapid progress of Hitler's nies brought the country face to face with extremely grim ities. The Labour party disliked compulsory military service, when the new British government, under Winston Churchill, wed its determination to carry on even without France, the our government, after calling a party conference, declared for scription both of men and wealth.

'he voluntary system of enlistment had produced a steady flow of men to the colours, but its unfairness was the subject of increasing public protest. The National Service emergency regulations provided for a general reserve of three classes, single men, married men and women. If necessary, single men between 21 and 41 might be selected by ballot for service overseas. By July 22, when voluntary enlistment for the army ceased, some 80,000 men had volunteered for service overseas, 63,747 for the army, more than 14,000 for the air force, and the balance for the navy. The arrival of the first and third echelons of the second New Zealand expeditionary force in Egypt in February and October respectively and of the second echelon in Britain in June aroused world-wide interest. In the royal air force, exploits of New Zealanders who numbered about 1,400 by the end of the year, were recognized by many awards of the distinguished flying cross.

In July protracted negotiations between the government and the opposition led to the formation of the following war cabinet: P. Fraser (prime minister), W. Nash (minister of finance), and F. Jones (minister of defence), of the Labour party, and A. Hamilton, leader of the opposition, and J. G. Coates, a former prime minister, of the National party. The labour cabinet was continuing to function for the administration of affairs not directly concerned with the country's war effort. Any action necessary to secure co-ordination between the two cabinets was to be taken by the prime minister.

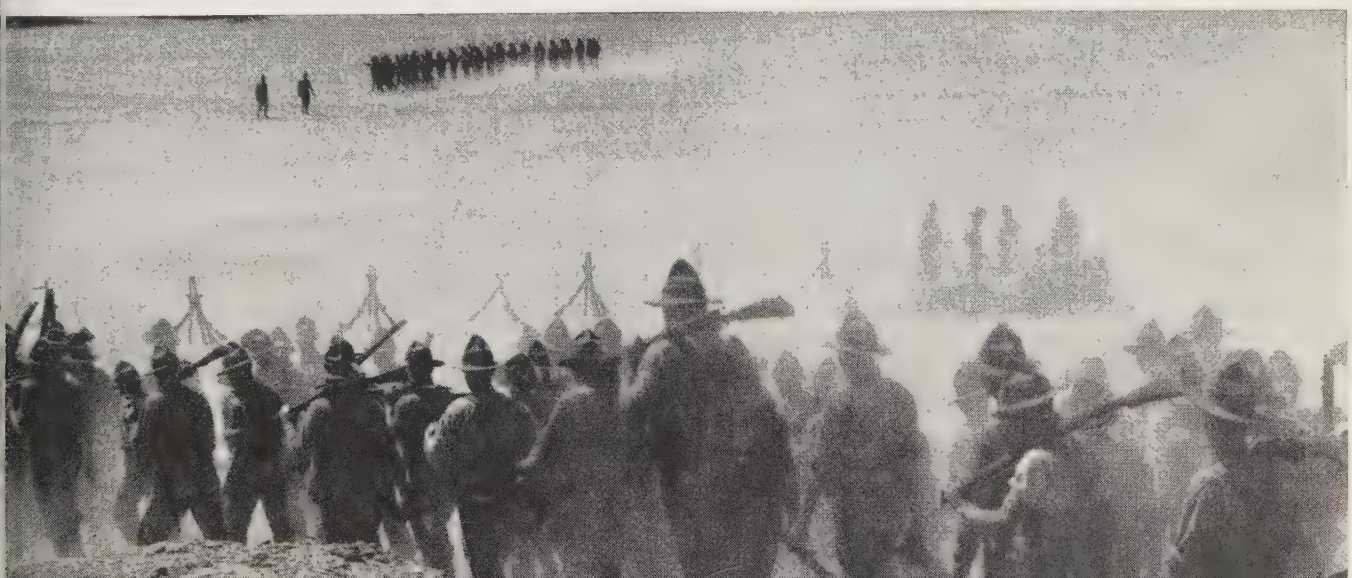
Though a small nation in the military sense, New Zealand has primary industries of vast importance to the empire's war effort in view of the absorption of Denmark, Holland and other sources of Britain's food supplies in the nazi machine. A production plan drawn up for the farming industry involved considerable increases in production of cheese, bacon and beef, without reducing the quantity of butter and lamb sent to Britain. The minister of supply was given ample powers to control all production in the interests of the war effort. The minister of finance was given the power to raise compulsory loans.

The adhesion of Japan to the axis created additional problems for New Zealand, but the country can reasonably expect to repel any attempt at invasion. The economic pressure which can be applied to Japan must be a formidable factor in assuring the safety of New Zealand.

Education.—(July 1939) Elementary: state schools 2,213; scholars 203,739; intermediate schools 17; scholars 4,542; post-intermediate 197; scholars 41,577. University of New Zealand has six constituent colleges, including the two agricultural colleges at Lincoln and Palmerston North, grouped together as the New Zealand School of Agriculture.

Defence Forces.—(Expenditure from war expenses account):

KED TROOPS of New Zealand at their camp near Cairo, Egypt in 1940



actual 1939–40, navy £902,702; army £3,572,532; air £2,596,145; estimated 1940–41, navy £1,500,000; army, £30,000,000; air £6,000,000.

Banking and Finance.—Revenue, consolidated fund (1939–40) £37,974,159, war expenses account (1939–40) £2,181,835, (est. 1940–41) £14,120,000; expenditure, consolidated fund (1939–40) £37,654,820; budget estimate (1940–41) £37,034,000; public debt (March 31, 1940) £322,907,536; note circulation, active (July 29, 1940) £19,623,000; reserve (in Reserve bank, Aug. 19, 1940) gold £2,802,000; sterling £12,192,000; (in Reserve bank, Oct. 21, 1940) gold £2,802,000; sterling £8,821,000. Exchange rate: £N.Z.125=£100 sterling. Owing to the diversion of revenue and expenditure to the war expenses account, these figures are not strictly comparable to those of previous years.

Trade and Communication.—Overseas trade (merchandise): imports (1939) £49,387,183; Jan.–June 1940 £24,869,580; exports (1939) £57,407,680; (Jan.–June 1940) £44,302,738; re-exports (1939) £601,037. Communications and transport: roads suitable for motor traffic (March 31, 1940) 48,521 mi.; railways open to traffic (March 31, 1940) 3,390 mi.; shipping (1939) entered 2,974,833 tons net; cleared 3,032,981 tons net; commercial air transport (1939): aircraft engaged 20; miles flown 1,950,546; passengers carried 57,337; mail and freight carried 498,519 lb.; motor vehicles licensed (March 1940): cars, taxis, etc., 246,588; trucks 50,983; buses 754; cycles 19,201; wireless receiving set licences 338,249; telephones, number of subscribers 165,151.

Agriculture and Minerals.—Values in New Zealand currency in 1937–38: agricultural £6,900,000; pastoral £32,000,000; dairying and poultry £28,900,000. Production in 1939–40, wheat 8,010,089 bu.; butter (export 1939) 2,449,211 cwt.; cheese (export 1939) 1,671,343 cwt.; coal (1939) 2,342,639 tons; potatoes 87,671 tons; oats (1939–40) 2,081,106 bu.; barley (1939–40) 915,805 bu.; cattle (1940) 4,533,032 head; horses 271,581; pigs 714,001; gold (1939) 178,955 fine ounces. For additional statistics *see* Hogs; Mercury; Superphosphates; Wool.

(A. J. Hp.)

Nicaragua, a Central American republic lying between Honduras and Costa Rica and reaching from the Caribbean sea on the east to the Pacific ocean on the west; language, Spanish; capital, Managua; president, Anastasio Somoza. The area is 49,000 sq.mi. Census statistics are officially admitted to be woefully inadequate. The latest census, that of 1920, showed a total population of 638,119 but was admittedly incomplete. Subsequent unofficial estimates have placed the figure at from 850,000 to 1,100,000. The chief cities, with their respective populations (estimated in 1935) are: Managua, 61,679; León, 58,957: Matagalpa, 39,271: Granada, 27,120.

The Nicaraguan economic situation substantially improved in 1940 as the government took several important steps to counteract unsatisfactory conditions brought on by the European war. These included acceleration of highway construction, strict government economy, and aid to agriculture through credits to producers and assistance in purchase of agricultural machinery. Exports of coffee, at slightly higher prices, increased, while gold exports, largely to the United States, rose to such an extent that coffee was displaced as the leading export commodity. Negotiations begun in 1939 resulted in the granting, by the United States Export and Import bank, of a $2,000,000 credit to the Nicaraguan government. Proceeds of the loan were used to continue work on the Nicaraguan section of the Inter-American highway, to be completed in two years, and for other public works projects. A United States army commission continued study of the feasibility of a barge canal to connect Lake Nicaragua with the Caribbean by way of the San Juan river. Tentative approval of plans by the Costa Rican government removed one of the major obstacles. The barge canal project was regarded by some observers as paving the way for an eventual Nicaraguan trans-isthmian canal. Co-operation with the United States and adherence to hemisphere solidarity were pledged by President Somoza. Purported "fifth column" activity in Nicaragua resulted in charges that several Congressmen were engaged in subversive activities, while the government prohibited publication of nazi propaganda.

Nicaragua has good external communication by water and by air, but communications within the country are limited. There are 171 mi. of government railway and an undetermined amount of short, privately owned lines. The 900 mi. highway system is being expanded, and by Aug. 1939, 245 mi. of the Inter-American highway system had been constructed. There were 1,327 telephones, nearly half of them in Managua. In 1939, the foreign trade of Nicaragua was valued at $14,665,863, a sharp increase of 33·3% over 1938. Value of exports was $8,300,972, a marked rise of 41·1%, with gold (42·2%), coffee (30·0%) and bananas (7·9%) the principal items. Of the exports 77·5% went to the United States and 10·9% to Germany. Gold-mining was largely in foreign hands, however, and the net benefits to the country accruing from increased production were relatively small. The coffee industry, which had been in difficulties since 1937, was materially aided by the Inter-American Coffee Quota Agreement of Nov. 1940, under which Nicaragua was allotted an export quota to the United States of 195,000 bags. Exports in 1938 were 117,943 bags. Imports (textiles, machinery and food products) valued at $6,364,891 (an increase of 24·3%) were largely from the United States (68·4%) and Germany (12·2%). The monetary unit was the córdoba, tied to the U.S. dollar at 20 cents. Primary education was free and compulsory. In the 1937–38 school year there were 796 primary schools, with 53,184 students, and 8 secondary schools, with 849 students.

(L. W. Be.)

Nickel. No direct information was available on nickel production in 1940, but sales were reported to have risen to a record figure, which would mean 125,000 short tons or more. Canadian production, which usually accounts for about 90% of the total, made a new record high in 1939 at 113,053 short tons and this figure was presumably exceeded in 1940. The 1940 increase in consumption was largely in the United States, where total imports for the first ten months of the year exceeded by 14% those for the whole of 1939, which had in turn exceeded any previous year by 21%. On the basis of the scanty data available, one might venture to estimate the 1940 consumption at 143,000 short tons and Canadian output at 129,000 tons. War demand intensified the efforts to develop sources of supply in minor producing areas by those countries lacking access to Canadian supplies, especially the axis powers.

The German position was helped by the seizure of Norway, but not to the extent that might be thought, since Norway's domestic output was only about 1,000 metric tons, the remainder of the 7,000–8,000 tons ordinarily credited to that country having been recovered from matte imported from the Falconbridge mine in Canada. (In this connection it may be reported that the International Nickel Co. offered to handle the Falconbridge ores on a toll basis while the Norwegian smelting facilities of this company were inaccessible.) It is also understood that Germany sought Finnish ore through Russia, but up to the end of 1940 it was thought that no ores were produced at the Petsamo mine. Domestic ore production was being pushed actively, but the grade of ore of the German deposits was so low that there was little relief in this quarter.

Italy's former supply came chiefly from Norway and Canada; in 1940 only the meagre domestic output of Norway was left, and

is Germany would presumably get the lion's share. As a re-
ef measure, all nickel coins were withdrawn from circulation,
elding an estimated 1,600 metric tons of nickel. Domestic
urces were small.

For several years Japan attempted to establish sources of sup-
y, especially in New Caledonia, Netherlands East Indies and
razil, and to develop her own scanty domestic resources so far
justifiable, but there was no information available on the
tual status of affairs beyond the fact that considerable amounts
ore were imported from New Caledonia. (G. A. Ro.)

icotinic Acid: *see* BIOCHEMISTRY; CHEMOTHERAPY; DIE-
TICS; MEDICINE; PELLAGRA; VITAMINS.

iger: *see* FRENCH COLONIAL EMPIRE.

igeria: *see* BRITISH WEST AFRICA.

itrates. There are small deposits of nitrate-bearing earth or shale in China, Egypt, and Spain, which are locally ed to a small extent for fertilizer, and an output of 6,000–8,000 ns of potassium nitrate in India, but the only natural nitrates ploited on an extensive scale are the caliche beds of northern ile, which carry 10–25% of sodium nitrate, and which supplied e bulk of the world's nitrate requirements for a century. The aximum output attained was 3,238,000 metric tons in 1929, clining to 439,000 tons in 1933, with a recovery to 1,427,000 ns in the fiscal year 1938–39. Steady progress in the develop-ent of the synthetic processes was made during the war of 14–18, and the natural nitrates industry dropped to a point ere in 1928–29, according to the figures of the British Sulphate Ammonia federation, it furnished only 22% of the world pply, although this was the record year of Chilean output. The pression then took a heavy toll of the Chilean industry, while anufactured nitrogen suffered little, and in 1932–33 Chilean trate supplied only 7% of the world total nitrogen supply. though the Chilean output has shown a heavy increase since 32, synthetic production has expanded so rapidly that in 1938– the Chilean share of the world total supply had increased only 8%. The synthetic plant capacity now available is far in excess the total world demand for combined nitrogen. (G. A. Ro.)

ixon, Lewis (1861–1940), U.S. shipbuilder, was born in Leesburg, Va., April 7. He was graduated from e United States Naval academy in 1882 and was sent by the vy department to continue his studies at the Royal Naval col-ge in Greenwich, England. In 1884 he was transferred to the nstruction corps of the navy, where he designed the battleships Oregon," "Indiana" and "Massachusetts." He resigned from the vy in 1895 and began to build ships on his own account at lizabeth, N.J., where he built 100 vessels in six years. He inter-ted himself in politics in New York city and was appointed esident of the East River Bridge commission in 1898 by Mayor an Wyck. When Richard Croker retired as leader of Tammany all he succeeded to that post, but held it for only six months. 1919 he was appointed superintendent of public works by the overnor of New York and later he served on the public service mmission. He died in Long Branch, N.J., Sept. 23.

obel Prizes. The customary annual awards of Nobel prizes did not take place in 1940. Shortly after ermany invaded Norway the nazis blocked the bank account of e Norwegian Nobel prize committee, and reports from Oslo in ctober indicated the possibility that the funds might be seized ermanently. A dispatch from Oslo via Berlin on Dec. 16, stated mply that the peace prize "will not be awarded this year." The anting of this prize to Carl von Ossietzky in 1936 became a sort of *cause célèbre* in Germany, and no German thereafter was allowed to accept a Nobel prize. There was no peace prize in 1939; in 1938 it went to the Nansen office in Geneva.

The following received Nobel prizes in 1939: Gerhard Domagk, Germany (medicine); Ernest O. Lawrence, U.S.A. (physics); Adolph Butenandt, Germany, and Leopold Ruzicka, Switzerland (chemistry); Frans Eemil Sillanpää, Finland (literature). Domagk and Butenandt refused their awards. The prizes in medicine, physics, chemistry and literature are awarded in Stockholm.

Noble, Gladwyn Kingsley (1894–1940), U.S. herpetologist, was born in Yonkers, N.Y., Sept. 20. He was graduated from Harvard university in 1917 and while an undergraduate headed exploring expeditions in search of zoological specimens. He became curator of the department of herpetology in the American Museum of Natural History, New York city, in 1919 and nine years later curator of the museum's department of experimental biology. He died in Englewood, N.J., Dec. 9.

Norris, James Flack (1871–1940), U.S. chemist, was born in Baltimore, Md., Jan. 20, and was graduated from Johns Hopkins university in 1892. He taught chemistry in the Massachusetts Institute of Technology, Simmons college and Vanderbilt university from 1895 until 1916, when he was called back to the Massachusetts institute as professor of organic chemistry and director of the laboratory. He was in charge of war gas investigation for the U.S. bureau of mines in 1917–18 and directed the U.S. chemical warfare service in England in 1918. He was president of the American Chemical society in 1925–26 and vice-president of the International Union of Pure and Applied Chemistry 1925–28. He was the author of several books on chemistry. He died in Boston, Aug. 3.

North Borneo: *see* BORNEO.

North Carolina, popularly known as the "Old North state" or the "Tar Heel state," is one of the Atlantic coast states of the United States; area 52,286 sq.mi.; population according to the U.S. census of 1940, 3,571,623. Capital, Raleigh, 46,897; Charlotte, the largest city, 100,899. Of the state's population in 1940, 974,175 (27·3%) were urban. In 1930, Negroes numbered 29%, and foreign-born, 8,788.

JOSEPH M. BROUGHTON, Democrat, was elected governor of North Carolina in 1940

History.—The year was characterized by activity in politics and national defence. In the cleanest and mildest Democratic primary in a decade, J. M. Broughton led the unprecedented field of 7 candidates for the gubernatorial nomination on May 25 and became the party nominee when runner-up Lieut.-Gov. Wilkins P. Horton declined to demand a second primary. In Nov. 1940 he was elected over his Republican opponent, R. H. McNeill, by the record majority of 413,342. R. L. Harris was elected lieutenant governor. Other

state officers and congressmen (all Democrats) were re-elected. Conservative Governor Hoey sought to swing the state Democratic party to Cordell Hull for president, but the state convention in May endorsed for a third term Franklin D. Roosevelt who carried the state in November over Republican Wendell Willkie by the unprecedented majority of 395,382 in a total vote of 822,648.

In the interest of national defence, the national guard was encamped and the first peacetime conscription was launched. The vast national defence program stimulated industrial employment and prosperity in the state, through lucrative government contracts for supplies, the great expansion of Ft. Bragg and the establishment of a coast guard air base at Elizabeth City and of Ft. Davis, an antiaircraft firing centre at Holly Ridge. But agriculture faced a war-shrunken market. In July the North Carolina tobacco farmers joined with those of the other tobacco states in voting for federal crop control for three years; and in December federal control of the cotton crop for 1941 was adopted by the cotton farmers of North Carolina and other cotton states.

On Nov. 1, the Pennsylvania Central air lines inaugurated an east-west passenger and express service between Norfolk, Va. and Knoxville, Tenn., via the North Carolina towns of Rocky Mount, Raleigh and Greensboro.

Winter cold, snow and sleet and August floods wrought millions of dollars of damage to the highway system, which was repaired in part by allocations by the governor from the highway fund surplus.

By popular vote Johnston became the first county to close within its borders the state system of liquor stores.

Important state officers (1940): Clyde R. Hoey, governor; Wilkins P. Horton, lieutenant governor; Thad Eure, secretary of state; George Ross Pou, auditor; C. M. Johnson, treasurer; Clyde A. Erwin, superintendent of public instruction; Harry McMullan, attorney-general; W. P. Stacy, chief justice.

Education.—North Carolina maintains separate public schools for whites, Negroes and Indians, with minimum eight months' term and compulsory attendance from 7 to 13 years of age, inclusive. In 1938–39, there were 3,973 public elementary and 962 high schools, with 25,448 teachers and 892,543 enrolment, operated at a cost of $30,459,626, about four-fifths of which was contributed by the state government. The state appropriation for 1940–41 is $27,000,000. The state maintained three branches of the consolidated University of North Carolina at Chapel Hill, Raleigh and Greensboro, with an enrolment of 15,821 in 1938–39, as well as 12 standard and teachers' colleges (six for whites, five for Negroes, one for Indians). There were 41 private colleges for whites and Negroes. There were 9,804 prisoners in the state prison and various road camps on July 1, 1940; and in December, 37,157 aged persons and 23,564 dependent children received public grants, averaging $10.12 and $6.91 per capita, respectively.

Banking and Finance.—In 1939–40, state expenditures were $144,835,270; receipts $144,042,822. The assessed value of real and personal property was $2,337,223,566 in 1939. The state bonded debt was $147,733,500 on June 30, 1940. There were 43 national banks with deposits of $111,159,000 and 185 state commercial and industrial banks and trust companies, with $370,672,220 on June 30, 1940. In 1940 there were 4,596 mi. of railroads, 494 mi. of city bus routes, 6,756 mi. of passenger vehicle routes and 6,753 mi. of freight vehicle routes; and the state highway and public works commission maintained 11,309 mi. of state highways and 47,385 mi. of county roads, of which 10,946 mi. were hard surfaced. Federal internal revenue collections of $326,920,750 in North Carolina in 1937–38 were exceeded only by those in New York, Illinois and Pennsylvania.

Agriculture, Manufactures and Mining.—In 1937, 2,896 manufacturing establishments employed 258,771 wage earners wages of $189,266,474 and made products valued at $1,384,73 686. The leading industries were tobacco, cotton goods, knit goo and furniture. The mineral production in 1939 was valued $14,959,228, chiefly granite, sand and gravel, feldspar, mica a ceramics; the kilowatt-hour production of electricity in 1939 w 2,488,617,000. The total acreage of United States lands in n tional forests in the state was 929,612 in 1940. The value of t lands and buildings on the 300,967 farms in North Carolina 1935, approximately half of which were operated by tenants, w $622,834,983. The North Carolina Farm survey, 1939, report 288,440 farms in the state. In 1940, the total value of the major crops decreased 8% below that in 1939 to $213,353,000, which tobacco and cotton accounted for $129,044,000. Due main to the federal control program, tobacco decreased 38% in produ tion, to 506,820,000 lb. but only 30% in value, to $86,524,000.

Cotton production increased from 457,000 bales in 1939 to 74 000 in 1940 with a value (including seed) of $42,520,000.

BIBLIOGRAPHY.—*Blue Book of Southern Progress* (1940); current newspapers; reports of state offices. (A. R. N.)

North Dakota, north-central state of the United States and popularly known as the "Flickertail state" has an area of 70,837 sq.mi. and a population of 641,935 (1940 The capital is Bismarck, population 15,496 (1940). Cities wi larger population were: Fargo, 32,580; Grand Forks, 20,228; a Minot, 16,577. Of the population of the state 131,923 were urb and 510,012 rural in 1940.

History.—Principal officers of the state were: United Stat senators, William Langer and Gerald P. Nye; representatives congress, Usher L. Burdick and Charles R. Robertson; governo John Moses; lieutenant governor, Oscar W. Hagen; secretary state, Herman Thorson; state auditor, Berta E. Baker; sta treasurer, Carl Anderson; attorney-general, Alvin C. Strutz; co missioner of insurance, Oscar E. Erickson; commissioner of ag culture and labour, Math Dahl; public service commissioner Ben C. Larkin and C. W. McDonnell; superintendent of publ instruction, Arthur E. Thompson; state tax commissioner, Jo Gray; judges of the state supreme court: A. G. Burr, chief ju tice; W. L. Nuessle, A. M. Christianson, James Morris, Thomas Burke. In the presidential election of 1940 Willkie received 15 590 votes; Roosevelt, 124,036 votes.

Education.—The institutions of higher learning are the sta university and school of mines, the agricultural college, three sta teachers' colleges, two normal schools, the school of forestry a the school of science. The total enrolment in these institutio for the academic year of 1939–40 was about 7,500. The enrolme in the high schools for the same year was 33,914 and for the ru and elementary schools, 105,782. The total cost of operati these schools was $9,979,906. The institutions of higher learni are under the unified control of a board of higher education co posed of seven members appointed by the governor from a li furnished by an ex officio nominating committee.

Finance.—On June 30, 1940, 120 state banks and one tru company operating within the state of North Dakota, reported i vested capital, including $821,000 debentures held by the Reco struction Finance corporation, of $4,548,000 and total depos of $24,447,000. On June 30, 1940, latest date for which inform tion was available, 47 national banks operating within the sta of North Dakota reported a total invested capital of $5,866,0 which amount included preferred stock held by the Reconstru tion Finance corporation and total deposits of $49,895,000.

Agriculture, Manufactures and Minerals.—In 1940 the were under cultivation 23,930,032 ac. and the estimated value w $707,138,992. The estimated farm income for the year was $19

o,000. For 1940 the state produced 12% of the total wheat oduction in the U.S., 50% of all spring wheat produced and % of the national production of durum wheat. The state stood st in the number of bushels of wheat stored on federal loan, ,343,015 bu. The state produced 12.5% of the national pro- ction of flax and stood second in the production of certified seed tatoes, 2,361,040 bu. Its total production of potatoes was ,920,000 bu. for 1940. The state mined in 1939 2,131,252 tons lignite coal, valued at $2,425,000. (O. G. L.)

orthern Ireland: *see* IRELAND, NORTHERN.

orthern Rhodesia: *see* RHODESIA.

orthern Territory, of Australia; area 523,620 sq.mi.; pop. (June 30, 1939): Aboriginals, full- ooded, 14,089; half-caste, 913; white (est. Dec. 31, 1939), 6,973.

History.—As an urgent defence measure, work was com- enced in 1940 on the construction of a strategic road to connect e two railway termini at Alice Springs and Birdum. The mili- y authorities were providing camps, rations, medical services d transport and the road authorities of the states of New South ales, Queensland and South Australia were co-operating in pro- ling the technical equipment and labour. The length of the ojected road is 625 mi. and 500 workmen were engaged on this sk which was estimated to cost £200,000.

The federal government commenced the construction of a wharf Darwin as part of the scheme for the establishment of an im- rtant base. The new structure was estimated to cost £160,000 d was to be large enough to accommodate vessels of capital ss and was to include modern equipment for the handling of rgo.

Finance.—Revenue (1939–40), actual, £A.99,634; from Cen- l Australia railway (1939–40), £A.150,763; from North Aus- lia railway (1939–40), £A.56,955. Expenditure, ordinary ap- opriation (1939–40), £A.382,802.

Agriculture, etc.—Production in 1938–39: pastoral industry, ..426,021; gold, £A.115,835; pearl shell, £A.31,500. Railways, vernment (Dec. 31, 1938), 508 mi. (W. D. MA.)

orthrup, Edwin Fitch (1866–1940), U.S. electrothermic engineer, was born in Syracuse, Y., Feb. 23. He was graduated from Amherst college in 1891 d did postgraduate work at Cornell and Johns Hopkins. After a ar in general engineering work he became associated with the owland Printing Telegraph company and remained as its con- uction engineer until 1902. He was then associated with a com- ny manufacturing electrical instruments in Philadelphia until 10, when he joined the faculty of Princeton university, remain- g there until 1919. He held patents on 104 devices for the pro- ction and measurement of high temperatures, including an in- ction furnace which produced a temperature of 3,000° in 1931. e died at Princeton, N.J., April 29.

orthwestern University was chartered in 1851 as an in- stitution of higher learning un- r the control of the Methodist Episcopal Church. The univer- y comprises the following divisions: the college of liberal arts, e graduate school and the schools of engineering, music, edu- tion, speech, commerce and journalism, all located in Evanston uburb of Chicago) on a campus bordering Lake Michigan; the edical, law and dental schools and the evening departments of e university, all on Chicago's near north side, on a campus six ocks from the loop business district. The enrolment of the uni- rsity for the first semester of 1940–41 consisted of 6,315 full- ne students, of whom 4,985 were registered on the Evanston campus; and 9,200 part-time and evening students, of whom 8,342 were registered on the Chicago campus. The 1940 summer session had an enrolment of 5,076 students.

During the calendar year of 1940, the university received gifts totalling $2,426,573, including a gift from the Clara A. Abbott trust of $1,662,748 for medical, chemical and surgical research. The budget for the year 1940–41 totalled $5,967,580 and the value of all land and buildings used for educational purposes was $17,333,997. The faculty of the university, including lecturers and demonstrators, totalled 1,471, of whom 798 were full-time members. The university's productive endowment amounted to $24,904,797.

One of the important developments during the year was the building of the Northwestern Technological institute, made possible by a gift of $6,735,000 from the Walter P. Murphy Foundation.

During the year the university completed construction of three new buildings: Abbott hall, a $1,500,000, 18-story dormitory on the Chicago campus; Scott hall, a $650,000 student social centre and auditorium on the Evanston campus; and Patten gymnasium, a new intramural gymnasium costing $425,000.

Northwest Territories embrace all of the mainland in Canada east of Yukon territory and north of the provinces; all islands in Hudson and James bays and Hudson strait, including Ungava bay; all the Arctic islands north of the mainland within the area bounded on the east by a line passing midway between Greenland and Baffin, Devon and Ellesmere islands, to and along the 60th meridian of longitude to the north pole, and on the west by the 141st meridian of longitude to the pole. The land and water area is estimated at 1,309,682 square miles. The 1931 census shows a population of 9,723 composed of Eskimos, Indians and whites.

Government.—The Northwest Territories are governed by a territorial council composed of a commissioner, deputy commissioner and five councillors appointed by the governor general in council. The seat of government is at Ottawa.

Trade and Communication.—The welfare of the native population and the conservation of the wild life upon which the natives depend for subsistence are among the chief responsibilities of the administration. An aggregate area of 609,277 sq.mi. has been set aside as game preserves or sanctuaries. Hunting and trapping by others than natives is restricted. Trapping for, and trading in, furs is regulated by permit. The government reindeer industry in the northern Mackenzie district is progressing favourably. Access to the Northwest Territories is by ocean and river transport and by air. Communication is maintained by mail and radiotelegraphy.

Mining.—Development at the Con, Negus and Rycon mines in the Yellowknife area continued, their monthly gold production averaging some $70,000, $60,000 and $7,000 respectively. The pitchblende-silver mine of Eldorado Gold Mines, Limited, at Great Bear lake, discontinued operation in June 1940, the company having sufficient concentrates on hand for the requirements of their refinery at Port Hope, Ont., for more than two years. More than 4,500 mineral claims were in good standing throughout the territories on Sept. 1, 1940. A notable development in 1939 was the erection near Norman, by Northwest company, of a refinery with a capacity of 840 bbl. per day which is producing aviation gasoline and light and heavy diesel oil. (R. A. G.)

Norway, country of northwest Europe. Bounded N. by the Arctic ocean, E. by Finland and Sweden, S. and W. by the North sea and Arctic ocean. Area 124,556 sq.mi.; population (est. Jan. 1, 1939), 2,921,000. Chief towns (population

GERMAN INFANTRYMEN, dismounted from their bicycles, reply to an ambush under cover of a light tank on a Norwegian road in April 1940

1930): Oslo (capital, 253,124); Bergen (98,303); Trondhjem (54,458); Stavanger (46,780). Language: Norwegian; religion: Christian (Evangelical Lutheran).

History.—The conflict between Norway's great power neighbours, which broke out in 1939, threatened her security and disrupted her economy in much the same way as had the struggle of 1914–18. Now the danger was greater because the perfected instruments of mechanical warfare vastly increased the range of operations. For the first time in its history Norway was brought directly within the strategic orbit of continental warfare. First the Russo-Finnish war brought a demand for the passage of Allied troops through Norway. The government refused the demand and clung tenaciously to strict neutrality. Sympathy was with the Finns, and many Norwegians felt as did the Swedes that the blow against Finland was a blow against the entire north; but aid to the Finns was confined to small contributions of arms and funds and to care for refugees.

"Incidents" increased in number and danger. Norwegian vessels were sunk by mines and submarines, and trade routes were disturbed; but the Norwegian merchant marine, one of the largest in the world (with about 5,000,000 registered tons), kept on doing business on the sea lanes. In the spring of 1940 the belligerents strained Norwegian hospitality and neutrality in such incidents as those of the "City of Flint" (1939) and the "battle" of Jössing fjord. One basic difficulty was that Germany still obtained much iron ore through Narvik. On April 8, 1940, Britain took the bull by the horns and mined Norwegian territorial waters at several points. In heated protest the Norwegians implicitly threatened war. Hardly was the ink dry on the protest when Norway found herself attacked and invaded, April 9, at all her important ports, not by the British but by the Germans.

The utter surprise of the attack, though obviously carefully planned and long prepared, was more decisive than the treason of a few men such as Vidkun Quisling (*q.v.*) and the commandant at Narvik. Popular stories of general treason were fabricated exaggerations, impossible in a country which was democratic, strongly national and thoroughly opposed in ideology to the principles of naziism. Norway had its "Nasjonal Samling," a party on fascist lines, but it polled only 2% of the vote and even with proportional representation had never elected a member to the parliament (storting).

(For the story of the invasion, *see* EUROPEAN WAR.)

The possibility of a Swedish occupation of Narvik, leaving the region north of that to Norwegian control, and the region south to German control, was being discussed just at the time the British and French forces withdrew from Narvik. This evacuation forced abandonment of the entire country to the Germans.

The legal aspects of German administration seem to have been more difficult in Norway than in any other of the occupied lands. The nazis failed in repeated attempts to get Haakon VII to abdicate. The Norwegian constitution contains a clause permitting the king and government to reside outside Norway for an indefinite period if approved by the storting. This power the storting voted after being chased from Oslo on April 9th. Therefore the government of the king and his ministers, who in June went to London, was unquestionably the only constitutional government according to Norwegian law. The Germans had difficulty even in establishing a temporary administration. Quisling could not get together a ministry. Hence the reich commissar, Josef Terboven had to assume definite leadership. An administration commission was established by the Norwegians on an interim basis, headed by Ingolf Christensen. Early in September, members of the storting gathered only semiofficially in Oslo to oppose the attempt to re-establish Quisling, and the Christensen commission was re-organized; the king was declared unable to function (according to reports; the fact at least was obvious) but other decisions were postponed. On Sept. 25 Terboven dissolved all parties except that of Quisling, set up a "state council" in which a Quisling group predominated; removed the king and declared Norway

Table I.—*Norwegian Wholesale Price Index*

Month	1939	1940	Month	1939	1940
January	97.3	118.8	July	98.0	132.1
February	97.4	123.8	August	98.4	136.0
March	97.3	130.3	September	99.9	135.0
April	97.6	131.3	October	108.3	.
May	98.0	130.9	November	114.4	.
June	97.6	130.2	December	116.3	.

Table II.—*Index of Cost of Living in Norway*

Month	1939	1940	Month	1939	1940
January	99.0	106.9	July	100.8	116.4
February	99.3	109.0	August	100.8	116.8
March	99.3	113.6	September	101.3	125.7
April	99.7	114.3	October	102.9	.....
May	99.9	115.3	November	104.9	.
June	100.5	115.5	December	106.8	....

Table III.—*Foreign Commerce of Norway*
(In millions of kroner)

Month	Imports		Exports	
	1939	1940	1939	1940
January	96.0	147.8	64.6	92.7
February	97.3	124.0	63.0	72.0
March	108.3	131.2	68.0	80.7
April	103.0	101.4	58.3	23.6
May	110.7	27.7	67.4	12.4
June	113.7	31.2	68.5	29.2
July	94.6	34.1	52.4	37.2
August	97.3	53.4	64.1	45.5
September	100.9	....	67.8	...
October	118.7	....	70.7	...
November	162.4	....	71.6	.
December	159.2	....	92.5	..

Table IV.—*Unemployed Seeking Work in Norway*

Month	1939	1940	Month	1939	1940
Jan.	35,046	29,924	July	19,158	31,300
Feb.	35,664	29,159	Aug.	19,711	25,900
Mar.	34,671	29,100	Sept.	24,438	...
Apr.	32,510	34,200	Oct.	27,480	
May	27,031	41,250	Nov.	30,248	
June	22,553	37,200	Dec.	30,500	

be neither a monarchy nor a protectorate, but "indefinitely cupied by German troops." In London the government could ntinue to function because it had not only saved the gold re-ve, but had been able to retain control of most of the great orwegian fleet. This government in exile established a system of dio reporting to the people at home and directed some 600 Nor-gians training as aeroplane pilots in Canada. Statistics of Ger-in demands on Norway indicated that the invaders extracted 5 tons of coffee in October and another 200 tons in November-ecember; 20 tons of chocolate; 400,000 bottles of brännvin naps). The army of occupation consumed practically all of the ailable pork, beef and eggs. Within Norway sabotage increased ainst railways and food supplies destined for Germany. The tch of fish was cut in half, unemployment grew, ships could t come home and trade with western Europe and America ased. Nevertheless the national spirit regained strength and ped for the ultimate departure of the 300,000 Germans who rrisoned their country.

Trade and Communication.—(1939): exports, 808,172,000 oner; imports, 1,361,835,000 kroner. Some of the impact of r on Norway is shown in Tables I–IV.

BIBLIOGRAPHY.—C. J. Hambro, *I Saw it Happen in Norway* (New York d London, 1940); *Britain's Designs against Norway* (German Library Information, New York, 1940); *Meddelelser fra Skipsfartsdirektoren* iweekly, New York, 1940–41). (F. D. S.)

ose: *see* EAR, NOSE AND THROAT, DISEASES OF.

otre Dame, University of. Administrative changes dominated 1940. Alumnus-iest-president Rev. John Francis O'Hara, C.S.C., was conse-ated on Jan. 15 the titular bishop of Milasa and auxiliary bishop the army and navy diocese of the United States, crucial post in e crisis of 1940. Succeeding him in the presidency is former ce-president Rev. J. Hugh O'Donnell, C.S.C., alumnus and able lministrator.

Rev. Charles C. Miltner, C.S.C., former arts and letters dean, ppointed president of the University of Portland (Ore.), was cceeded at Notre Dame by Rev. Francis J. Boland, C.S.C., head the department of politics.

A new building for the university press, a new heat-power lab-ratory, an addition to chemistry hall and a 7,000,000-volt gen-rator for atom-smashing featured 1940 construction.

Appropriate Laetare medalist of the year was Lt. Gen. Hugh A. rum, commanding the 2nd corps area, Governor's island, N.Y.

Committees began two significant tasks during the year: the efence committee, that of co-ordinating university facilities ith national needs; the centennial committee, that of preparing r the 100th anniversary of the founding of the university, ov. 26, 1842. Enrolment was 3,252 (capacity). (J. E. AR.)

lova Scotia, one of the original provinces of the Dominion of Canada; area 21,428 sq.mi.; population, ccording to the Canadian census of 1931, 512,846, estimated an. 1, 1941, 554,000. Capital, Halifax, 59,275. The only other ity in the province is Sydney, 23,089, which is the centre of the oal, iron and steel industries. Of the province's population, 81,192 are rural or 55%; 507,235 are Canadian born or 97%. nrolment in the public day schools was (1941) 120,127; in rivate day schools 2,723. The number of people who can neither ead nor write is 4·26% of the population. There are four uni-ersities in the province: Acadia, having an enrolment of 431 tudents; the University of King's college, with an enrolment of 9; Dalhousie, with an enrolment of 842, and St. Francis Xavier, ith 298 students. King's college is affiliated with Dalhousie. n addition there are an agricultural college and a normal school, both of which are financed by the provincial government.

The liberal government continued in office with the Hon. A. S. MacMillan, premier, provincial secretary and treasurer of the province. The lieutenant governor, who is appointed by the dominion government, is the Hon. Frederick F. Mathers. Nova Scotia is represented in the dominion house of commons by 12 members, ten of whom belong to the Liberal party, and in the dominion senate by ten members who are appointed for life.

The net value of production in 1937 was $102,321,783, an increase of 8% over the preceding year. The net value of agricultural products for the same year was $16,675,987, a slight increase over the preceding year. The net value of forest products in 1937 was $10,010,920; fish and fish products, $8,494,245; mining products, $22,597,547; manufactured products, $33,146,796, an increase of nearly 20% in comparison with the preceding year.

BIBLIOGRAPHY.—*The Royal Gazette; Report of the Duncan Commission.* (J. C. HE.)

Nursery Schools: *see* EDUCATION: *Nursery Schools.*
Nutmegs: *see* SPICES.
Nutrition: *see* DIETETICS; MEDICINE.

Nuts. Commercial varieties of nuts in the United States are reported by the department of agriculture as pecans grown in 12 states; walnuts grown in California and Oregon; filberts in Oregon and Washington, and almonds in California. Indicated production of California almonds was reported in October as 10,800 tons (1940 crop), compared to 19,200 tons in 1939 and a ten-year (1929–38) average of 12,700 tons. California walnut crop in 1940 was estimated at 46,000 tons as against 55,000 tons in 1939 and a ten-year average of 42,030 tons. The 1940 Oregon walnut crop was the same as in 1939 (4,400 tons), compared to a ten-year average of 2,340 tons. The 1940 filbert crop in Oregon was estimated at 2,580 tons, compared to 3,160 tons in 1939 and a ten-year average of 1,025 tons; in Washington, 600 tons in 1940, 590 in 1939, and 380 tons in 1938. The 1940 pecan crop was reported as 81,829,000 lb., compared to 63,639,000 lb. in 1939 and a ten-year average of 63,430,000 lb. Improved varieties produced 18,521,000 lb. of the 1940 pecan crop, 21,304,000 lb. in 1939 and a ten-year average of 16,499,000 lb. Wild or seedling varieties yielded 63,308,000 lb. in 1940 and 42,355,000 lb. in 1939, and 46,931,000 lb. in the ten-year average.

The United States imports about $14,000,000 of edible nuts annually. Of these Brazil nuts constitute the largest quantity, about 20,000,000 lb. of unshelled and 9,000,000 lb. of shelled nuts yearly. The 1940 crop of Brazil nuts, delivered at Para and Manaos (preliminary estimate by exporters), was 89,600,000 lb. A part of the crop was unharvested because of closing of the German market and reduced buying by the United Kingdom. Among foreign producers the 1940 almond crop in Italy was estimated at 20,600 short tons shelled, compared to 15,000 short tons in 1939. The Majorca, Balearic islands, almond crop was reported as 8,800 short tons shelled, as against 7,900 short tons in 1939. In French Morocco the 1940 almond crop was reported slightly larger than the 4,900-ton crop of 1939. Italian filbert production in 1940 was placed at 22,000 short tons unshelled, the same as in 1939, while in Spain the 1940 crop was estimated at 33,900 short tons unshelled. The Italian walnut crop in 1940 was estimated at 240,000

U.S. Pecan Production in 12 States in 1940

	Improved varieties lb.	Wild or seedling lb.		Improved varieties lb.	Wild or seedling lb.
Georgia	7,552,000	568,000	South Carolina	998,000	136,000
Texas	2,332,000	36,528,000	North Carolina	798,000	252,000
Alabama	2,142,000	238,000	Oklahoma	740,000	17,760,000
Florida	1,247,000	202,000	Arkansas	395,000	2,643,000
Louisiana	1,194,000	3,070,000	Missouri	33,000	511,000
Mississippi	1,087,000	1,177,000	Illinois	3,000	133,000

bags unshelled, compared to 200,000 bags in 1939 (110 lb. to the bag). (*See* also PEANUTS.) (S. O. R.)

Nyasaland: *see* BRITISH EAST AFRICA.

Nylon: *see* CHEMISTRY, APPLIED; INDUSTRIAL RESEARCH; PLASTICS INDUSTRY; RAYON; TEXTILE INDUSTRY.

Oats. The largest oats crop in the United States since 1932 was produced in 1940, estimated Dec. 1 by the department of agriculture as 1,235,628,000 bu. compared to 935,942,000 bu. in 1939. The 1932 crop was 1,250,955,000 bu. The ten-year (1929–38) average crop was 1,024,852,000 bu. The yield per acre in 1940 was 35·5 bu., the third highest on record. Per acre yield for 1939 was 28·4 bu. while for the ten-year average it was 27·4 bu. Stocks of oats on U.S. farms Oct. 1, 1940, were estimated at 1,011,060,000 bu. or 83% of 1940 production. On the same date in 1939 farm reserves totalled 763,347,000 bu. or 81·4% of the 1939 crop while the ten-year average holdings for that date were 819,178,000 bu. or 80·5%. The Canadian oats crop in 1940 was estimated at 430,413,000 bu. as against 408,432,000 bu. in 1939. The wartime efforts in the United Kingdom to increase production of feed grains and other farm products resulted in a 42% increase in the oats crop of England and Wales over that of 1939. No official figures are available, but reliable reports place the 1940 crop in England and Wales at 111,400,000 bu. In Sweden the 1940 crop was reported as 78,126,000 bu. compared to 88,525,000 bu. in 1939. (*See* also CEREALS.) (S. O. R.)

Production of Oats by States, 1939 and 1940

State	1940 bu.	1939 bu.	State	1940 bu.	1939 bu.
Iowa	206,640,000	155,496,000	Maine	4,520,000	4,598,000
Minnesota	180,795,000	151,652,000	California	4,350,000	3,944,000
Illinois	152,496,000	92,520,000	Mississippi	3,776,000	2,736,000
Wisconsin	96,793,000	71,012,000	Arkansas	3,058,000	2,904,000
Michigan	60,489,000	42,712,000	Alabama	3,000,000	2,838,000
South Dakota	53,240,000	43,929,000	Wyoming	2,915,000	2,288,000
Indiana	49,950,000	25,225,000	Louisiana	1,984,000	1,664,000
Missouri	48,600,000	40,920,000	Virginia	1,932,000	1,600,000
Ohio	44,880,000	33,150,000	Vermont	1,760,000	1,881,000
Kansas	43,596,000	21,173,000	Tennessee	1,760,000	1,445,000
Texas	37,125,000	28,750,000	West Virginia	1,462,000	1,400,000
Nebraska	35,760,000	20,576,000	New Jersey	1,419,000	1,260,000
North Dakota	33,432,000	34,546,000	Kentucky	1,400,000	952,000
Oklahoma	32,269,000	21,114,000	Maryland	1,120,000	1,128,000
Pennsylvania	31,080,000	26,274,000	Utah	1,073,000	980,000
New York	29,966,000	25,806,000	New Mexico	652,000	638,000
South Carolina	10,890,000	11,515,000	Arizona	297,000	230,000
Montana	9,034,000	8,002,000	New Hampshire	280,000	259,000
Washington	8,658,000	11,221,000	Nevada	280,000	248,000
Georgia	8,038,000	8,946,000	Massachusetts	238,000	231,000
Oregon	7,950,000	11,725,000	Connecticut	210,000	175,000
North Carolina	5,952,000	5,512,000	Florida	126,000	124,000
Idaho	5,106,000	6,232,000	Delaware	87,000	87,000
Colorado	4,530,000	4,205,000	Rhode Island	60,000	62,000

Obituaries. The following is a list of men and women who died during 1940. An asterisk (*) marks those for whom biographical notices are to be found in regular alphabetical position.

Name	Birth date	Death date
AAGE, PRINCE, cousin of King Christian of Denmark	June 10, 1887	Feb. 29
ABBOTT, ROBERT SENGSTACKE, U.S. publisher	Nov. 24, 1870	Feb. 29
*ABERCROMBIE, JOHN WILLIAM, U.S. educator	May 17, 1866	July 2
ADAM, ROBERT BORTHWICK, U.S. bibliophile	1803	Apr. 11
ADAMS, JOHN QUINCY, U.S. clergyman and author	Aug. 8, 1849	Jan. 1
ADAMS, T. ALBEUS, U.S. corporation executive	Sept. 4, 1864	Sept. 14
*ADAMS, THOMAS, British town planning expert	Sept. 10, 1871	Mar. 24
ADDINGTON, SARAH (MRS. HENRY REID), U.S. author	Apr. 6, 1891	Nov. 7
*ADLER, CYRUS, U.S. educator	Sept. 13, 1863	Apr. 7
ADLER, HARRY CLAY, U.S. newspaper executive	Sept. 8, 1865	Mar. 27
ADOLPHE, ALBERT JEAN, U.S. artist	Feb. 17, 1865	Nov. 12
AGLIPAY, REV. GREGORIO, bishop of the Philippine Aglipayan church	1860	Sept. 1
ALDRICH, CHESTER HOLMES, U.S. architect	June 4, 1871	Dec. 26
ALLEN, CHARLES LUCIUS, U.S. industrialist	Mar. 6, 1858	Nov. 4
ALLEN, FRANK GATES, U.S. industrialist	1858	Aug. 30
*ALSBERG, CARL LUCAS, U.S. biochemist	Apr. 2, 1877	Oct. 31
*ALSCHULER, ALFRED S., U.S. architect	Nov. 2, 1876	Nov. 6
ALTER, GEORGE ELIAS, U.S. lawyer	May 8, 1868	Aug. 18
ANDERSEN, HENDRIK CHRISTIAN, U.S. sculptor	Apr. 17, 1872	Dec. 19
ANDERSON, ABRAHAM ARCHIBALD, U.S. artist	Apr. 11, 1846	Apr. 2
ANDERSON, EDWARD D., U.S. brigadier general	1868	May 2
ANDERSON, GEORGE EVERETT, retired member of the U.S. consular service	Aug. 20, 1869	Mar. 17
ANDERSON, HAROLD MCDONALD, U.S. journalist	Aug. 22, 1876	Dec. 26
ANDERSON, JOHN CRAWFORD, U.S. judge	Aug. 5, 1863	Apr. 27
*ANDERSON, MARY (MME. A. F. DE NAVARRO), U.S. actress	July 28, 1859	May 20
ANDREW, CAPTAIN JOHN E., G.A.R. commander	1849(?)	June 30
*ANDREWS, REV. CHARLES FREER, British missionary	Feb. 12, 1871	Apr. 4
ANDREWS, WILLIAM, U.S. Salvation Army officer	1864(?)	July 21
ANGLE, DR. EDWARD JOHN, U.S. dermatologist	Apr. 1, 1864	Apr. 25
*ARCO, GEORG WILHELM ALEXANDER HANS, COUNT VON, German radio engineer	Aug. 30, 1809	May 7
ARNOTT, SIR JOHN ALEXANDER, Irish publisher	Nov. 16, 1853	July 26
ARONSON, LOUIS V., U.S. industrialist	Dec. 25, 1870	Nov. 2
*ARSONVAL, DR. JACQUES ARSÈNE D', French physician	June 8, 1851	Dec. 7
*ASHBROOK, WILLIAM ALBERT, U.S. congressman	July 1, 1867	Jan. 1
ASHBURN, PERCY MOREAU, U.S. physician and army officer	July 28, 1872	Aug. 20
ATKINSON, WILLIAM EDMONDS, U.S. motion picture official	Mar. 22, 1880	May 18
AUGHINBAUGH, DR. WILLIAM EDMUND, U.S. physician and author	Oct. 12, 1871	Dec. 18
AUSTIN, WILBERT JOHN, U.S. builder	Nov. 2, 1876	Dec. 4
*AZAÑA Y DIEZ, MANUEL, ex-president of Spain	Jan. 10, 1880	Nov. 4
*BAILEY, SIR ABE, South African promoter	Nov. 6 1864	Aug. 10
BAILEY, GUY WINFRED, U.S. educator	May 7, 1876	Oct. 22
BAILIE, EARLE, U.S. investment banker	Sept. 17, 1890	Nov. 15
BAIRD, REV. ANDREW BROWNING, Canadian educator	1855(?)	Sept. 22
BAKER, ASA GEORGE, U.S. publisher	Sept. 27, 1866	Sept. 10
BAKER, JAMES MARION, ex-U.S. diplomat	Aug. 18, 1861	Nov. 21
BAKER, WILLIAM ABRAM, U.S. industrialist	Aug. 27, 1881	Nov. 25
*BALBO, ITALO, Italian statesman and aviator	June 6, 1896	June 28
BALL, JOHN, British amateur golf champion	1861	Dec. 2
*BANKHEAD, WILLIAM BROCKMAN, U.S. statesman	Apr. 12, 1874	Sept. 15
*BARNES, GEORGE NICOLL, Scotch labour leader	Jan. 2, 1859	Apr. 22
BARNES, H. EDGAR, U.S. judge	June 28, 1883	Oct. 6
BARNES, RALPH WALDO, U.S. journalist	June 14, 1899	Nov. 18
*BARRÈRE, CAMILLE, French diplomat	Oct. 1851	Oct. 8
BARRETT, REV. JOHN, U.S. Catholic missionary	May 1, 1896	Jan 20
BARRETT, DR. MICHAEL THOMAS, U.S. dentist	July 27, 1881	Aug. 22
BARRY, REV. PATRICK, U.S. Roman Catholic bishop	Nov. 15, 1868	Aug. 12
BARTHELEMY, MARQUIS PIERRE DE, French explorer and philanthropist	1870	Oct. 30
BARTLET, JAMES VERNON, British church historian	Aug. 15, 1863	Aug 6
BARTOL, WILLIAM CYRUS, U.S. educator	Nov. 24, 1847	Oct. 31
BARTON, GEORGE, U.S. journalist and author	Jan. 22, 1866	Mar. 16
BATON, RENÉ, French musician	1879	Oct. 9
BAUMGARTEL, OTTO RICHARD, German-U.S. sculptor	Feb. 14, 1863	Mar. 2
BAUR, BERTHA, U.S. musical director	?	Sept. 18
*BECKHAM, JOHN CREPPS WICKLIFFE, U.S. senator and governor	Aug. 5, 1869	Jan. 9
*BEDFORD, DUKE OF (HERBRAND ARTHUR RUSSELL)	Feb. 19, 1858	Aug. 27
*BEER, THOMAS, U.S. author	Nov. 22, 1889	Apr. 18
BEGG, DR. ALEXANDER SWANSON, U.S. medical educator	May 23, 1881	Sept. 26
BEHREND, ERNEST RICHARD, U.S. paper manufacturer	Mar. 29, 1869	Sept. 22
BENJAMIN, WILLIAM EVARTS, U.S. antiquarian	Feb. 19, 1859	Feb. 24
BENSON, ALLAN L., U.S. author	Nov. 6, 1871	Aug. 19
*BENSON, EDWARD FREDERIC, British author	July 24, 1867	Feb. 29
BENTLEY, IRENE (MRS. HARRY B. SMITH), U.S. actress	?	June 3
BERG, WILLIAM HENRY, U.S. industrialist	Apr. 8, 1882	June 26
BERKLEY, DR. HENRY J., U.S. psychiatrist	July 17, 1861	Apr. 5
BERRY, SIR GEORGE ANDREAS, British ophthalmologist	1853	June 18
*BEST, SIR MATTHEW ROBERT, British admiral	June 18, 1878	Oct. 13
*BESTEIRO, JULIAN, Spanish statesman	1870	Sept. 27
*BIELSCHOWSKY, ALFRED, German ophthalmologist	Dec. 11, 1871	Jan. 5
BINKLEY, ROBERT CEDRIC, U.S. archivist	Dec. 10, 1897	Apr. 11
BIRCH, STEPHEN, U.S. industrialist	Mar. 24, 1872	Dec. 29
BISHOP, GEORGE TAYLOR, U.S. financier	Oct. 11, 1864	Aug. 24
BIXBY, EDSON KINGMAN, U.S. editor and publisher	Apr. 7, 1887	Mar. 17
BLACK, ALEXANDER, U.S. journalist and author	Feb. 7, 1859	May 8
BLAND, DR. PASCAL BROOKE, U.S. obstetrician	May 9, 1875	Oct. 31
BLATCH, HARRIOT STANTON, U.S. feminist	Jan. 20, 1856	Nov. 20
BLATCHLEY, WILLIS STANLEY, U.S. naturalist	Oct. 6, 1859	May 28
BLISS, WILLIAM JULIAN ALBERT, U.S. physicist	Jan. 22, 1867	Dec. 27
BLOCK, RUDOLPH (BRUNO LESSING), U.S. journalist	Dec. 6, 1870	Apr. 29
*BLOOD, SIR BINDON, British general	Nov. 7, 1842	May 16
*BLUMER, DR. GEORGE ALDER, U.S. psychiatrist	May 25, 1857	Apr. 25
BOCCHINI, ARTURO, head of the Italian police	1880	Nov. 20
BODDY, DR. EDMUND C., U.S. physician	1874	Jan. 12
BONAPARTE-WYSE, ANDREW NICHOLAS, Irish educator	1870	June 1
*BONCI, ALESSANDRO, Italian tenor	1870	Aug. 10
*BOOTH, BALLINGTON, British-U.S. religious leader	July 28, 1859	Oct. 5
*BORAH, WILLIAM EDGAR, U.S. senator	June 29, 1865	Jan. 19
BORDENAVE, ENRIQUE, Paraguayan minister to the U.S.A., 1933–36	Oct. 30, 1889	Jan. 24
BORGE, NATHANIEL, JR., Nicaraguan mathematician	1874	Nov. 16
*BOSCH, CARL, German chemist	Aug. 27, 1874	Apr. 26
*BOSTWICK, LUCIUS ALLYN, U.S. rear admiral	Feb. 1, 1869	Jan. 14
*BOURBON, JEAN PIERRE CLEMENT MARIE DE, DUKE OF GUISE	Sept. 4, 1874	Aug. 26
*BOURNE, JONATHAN, JR., U.S. legislator	Feb. 23, 1855	Sept. 2
BOWEN, DR. JOHN TEMPLETON, U.S. dermatologist	July 8, 1857	Dec. 3
*BOWER, BERTHA MUZZY, U.S. author	Nov. 15, 1871	July 28
BOYLAN, WILLIAM ALOYSIUS, U.S. educator	Jan. 6, 1869	July 8
BRADBURY, JAMES, U.S. actor	1857	Oct. 12
BRANDENBURG, WILLIAM A., U.S. educator	Oct. 10, 1869	Oct. 29
BRANDT, OLAF ELIAS, U.S. educator	Feb. 19, 1862	Feb. 20
*BRANLY, DESIRE EDOUARD EUGENE, French physicist	Oct. 23, 1844	Mar. 24
BRECKENRIDGE, LESTER PAIGE, U.S. mechanical engineer	May 17, 1858	Aug. 22
BRENTANO, THEODORE, U.S. judge	Mar. 29, 1854	July 2
BRETON, JULES LOUIS, French statesman	Apr. 1, 1872	Aug. 25
BRITT, JAMES EDWARD, U.S. boxer	Oct. 5, 1879	Jan. 22
BRONNER, HARRY, U.S. financier	Nov. 19, 1868	Dec. 21
BROWER, WILLIAM LEVERICH, U.S. drug manufacturer	Aug. 5, 1846	May 9
BROWN, DONALD LAMONT, U.S. industrialist	Nov. 17, 1890	Jan. 29
BROWN, FRANCIS SHUNK, U.S. lawyer	June 9, 1858	May 6
BROWN, DR. REXWALD, U.S. physician	May 6, 1878	June 21
BROWN, DR. SAMUEL HORTON, U.S. ophthalmologist	Nov. 16, 1878	June 12
*BRUSH, MATTHEW CHAUNCEY, U.S. corporation official	1887	Oct. 15
BRYAN, DR. WORCESTER ALLEN, U.S. surgeon	Sept. 1, 1873	Apr. 30
BUCKINGHAM, GEORGE TRACY, U.S. lawyer	Apr. 21, 1864	Sept. 9
BULGAKOV, MICHAEL AFANASIEVICH, Russian author	1891	Mar. 10

Name	Birth date	Death date
BUMSTEAD, ALBERT H., U.S. cartographer	1875	Jan. 9
BUNAU-VARILLA, PHILIPPE, French engineer	July 25, 1859	May 18
BUNDY, OMAR, U.S. major general, retired	June 17, 1861	Jan. 21
BURDICK, CHARLES KELLOGG, U.S. professor of law	Feb. 7, 1883	June 22
BURKAM, ELZEY GALLATIN, U.S. editor and publisher	Dec. 7, 1872	Mar. 13
BURKE, JAMES, U.S. electrical engineer	Apr. 7, 1873	Jan. 21
BURKHARDT, WILBUR NEIL, U.S. journalist	Nov. 11, 1889	June 27
BURNS, REV. JAMES ALOYSIUS, U.S. educator	Feb. 13, 1867	Sept. 9
BURTON, REV. CHARLES EMERSON, U.S. clergyman	Mar. 18, 1869	Aug. 27
BURTON, REV. LEWIS WILLIAM, U.S. bishop	Nov. 9, 1852	Oct. 17
BURTON, RICHARD (EUGENE), U.S. poet	Mar. 14, 1861	Apr. 8
BURWASH, MAJ. LACHLIN TAYLOR, Canadian Arctic explorer	1874	Dec. 21
BUSH, LINCOLN, U.S. engineer	Dec. 14, 1860	Dec. 10
BUTLER, CHARLES HENRY, U.S. lawyer	June 18, 1859	Feb. 9
BUTLER, MOTHER MARY JOSEPH, U.S. Catholic educator	July 22, 1860	Apr. 23
BUTLER, SMEDLEY DARLINGTON, U.S. Marine Corps officer	July 30, 1881	June 21
BUTTE, GEORGE CHARLES, U.S. lawyer	May 9, 1877	Jan. 18
BYRNE, REV. EDWARD J., Irish Catholic primate	1872	Feb. 9
BYRNE, MAJ. GEN. JOHN JAMES, U.S. militia officer	Sept. 12, 1872	Apr. 14
BYRON, CHARLES EDGAR, British rear admiral	1852	May 6
BYWATER, HECTOR CHARLES, British naval critic	Oct. 21, 1884	Aug. 17
CACCINI, VIRGILIO, Italian military engineer	1854	Jan. 27
CAHILL, MICHAEL HARRISON, ex-U.S. railroad president	Nov. 19, 1874	Mar. 26
CALDWELL, CHARLES POPE, ex-U.S. congressman	June 18, 1875	July 31
CALDWELL, CLIFFORD DOUGLASS, U.S. industrialist	Oct. 16, 1872	Apr. 16
CALLAHAN, PATRICK HENRY, U.S. industrialist	Oct. 15, 1866	Feb. 4
CALLAN, JOHN GURNEY, U.S. inventor	Apr. 7, 1875	Dec. 30
CALLBREATH, JAMES FINCH, sec'y emeritus, American Mining congress	Dec. 2, 1858	Aug. 4
CALLOW, JOHN MICHAEL, U.S. mining engineer	July 7, 1867	July 27
CALTHROP, DONALD, British actor	1888(?)	July 15
CALVERTON, VICTOR FRANCIS (GEORGE GOETZ), U.S. author	June 25, 1900	Nov. 20
CAMAC, DR. CHARLES NICOLL BANCKER, U.S. physician	Aug. 6, 1868	Sept. 27
CAMPBELL, BEATRICE STELLA, British actress	Feb. 9, 1865	Apr. 9
CAMPBELL, MARIUS ROBISON, U.S. geologist	1858	Dec. 7
CANAVAN, JOSEPH J., U.S. journalist and parole officer	Sept. 6, 1887	Oct. 10
CANBY, AL H., U.S. theatrical manager	1856	Oct. 15
CANTU, GIUSEPPE, Italian vice admiral	May 24, 1873	Oct. 24
CAREWE, EDWIN (JAMES FOX), U.S. motion picture director	Mar. 5, 1883	Jan. 22
CARPENTER, SIR H. C. HAROLD, British metallurgist	Feb. 6, 1875	Sept. 14
CARREL, FRANK, Canadian journalist	Sept. 7, 1870	July 30
CARSON, JOHN RENSHAW, U.S. research engineer	June 28, 1887	Oct. 31
CASEY, EDWARD PEARCE, U.S. architect	June 18, 1864	Jan. 2
CATURANI, DR. MICHELE GAETANO, Italo-U.S. gynaecologist	Nov. 11, 1873	Feb. 24
CHADDOCK, ROBERT EMMET, U.S. statistician	Apr. 16, 1879	Oct. 21
CHAMBERLAIN, ARTHUR NEVILLE, British statesman	Mar. 18, 1869	Nov. 9
CHAMBERLAIN, PAUL MELLEN, U.S. consulting engineer	Feb. 28, 1865	May 27
CHAMBERS, FRANK R., U.S. merchant	Sept. 3, 1850	Apr. 30
CHANDLER, SIR WILLIAM KELLMAN, British administrator	Feb. 9, 1857	May 24
CHANG SHAN-TZE, Chinese artist	1878	Oct. 20
CHARTERIS, SIR EVAN, British barrister and art expert	Jan. 29, 1864	Nov. 16
CHASE, REV. WILLIAM SHEAFE, U.S. clergyman	Jan. 11, 1858	July 16
CHESTER, REV. SAMUEL HALL, U.S. clergyman	Jan. 17, 1851	Apr. 27
CHHATRAPATI, SIR RAJARAM, Maharajah of Kolhapur	July 30, 1897	Nov. 26
CHICHESTER, SIR EDWARD GEORGE, British shipping executive	Jan. 22, 1883	Sept. 30
CHIPERFIELD, BURNETT MITCHELL, ex-U.S. congressman	June 14, 1870	June 24
CHITAMBAR, REV. JASHWANT RAO, Methodist bishop of Jubbulpore, India	1875	Sept. 4
CHRISTOPHER, PRINCE, of Greece	July 29, 1888	Jan. 21
CHRYSLER, WALTER PERCY, U.S. industrialist	Apr. 2, 1875	Aug. 18
CHURCHILL, BERTON, U.S. actor	1876	Oct. 10
CLARKE, MARGUERITE, U.S. actress	Feb. 22, 1887	Sept. 25
CLOONAN, DR. JOHN JOSEPH, U.S. physician	July 14, 1867	Jan. 28
CODMAN, DR. ERNEST AMORY, U.S. surgeon	Dec. 30, 1869	Nov. 23
COE, FRANKLIN, retired U.S. publisher	Oct. 4, 1871	Feb. 20
COHEN, WILLIAM W., ex-U.S. congressman	Sept. 6, 1874	Oct. 12
COLLINS, "EDDIE," U.S. comedian	1884	Sept. 1
COLLINS, EDWARD DAY, U.S. educator	Dec. 17, 1809	Jan. 1
COLLINS, HERMAN LE ROY, U.S. journalist	Jan. 30, 1865	Oct. 7
COLLINS, LORIN CONE, U.S. judge	Aug. 1, 1848	Oct. 18
COLQUITT, OSCAR BRANCH, ex-governor of Texas	Dec. 16, 1861	Mar. 8
COMBS, LESLIE, ex-U.S. diplomat	July 31, 1852	Nov. 18
COMPANYS, LUIS, Spanish patriot	1873	Oct. 16
COMPTON, MRS. EDWARD (VIRGINIA BATEMAN) British actress	Feb. 1, 1853	May 4
CONLEY, WILLIAM GUSTAVUS, ex-gov. of West Virginia	Jan. 8, 1866	Oct. 21
CONVERSE, FREDERICK SHEPHERD, U.S. composer	Jan. 5, 1871	June 8
COOK, FREDERICK ALBERT, U.S. explorer	June 10, 1865	Aug. 5
COOLIDGE, DANE, U.S. naturalist and novelist	Mar. 24, 1873	Aug. 8
COOPER, COURTNEY RYLEY, U.S. author	Oct. 31, 1886	Sept. 29
COPE, SIR ARTHUR STOCKDALE, British artist	Nov. 2, 1857	July 5
CORDIER, CONSTANT, U.S. colonel, retired	May 31, 1880	Feb. 24
CORNWALL, DR. EDWARD EVERETT, U.S. physician	July 2, 1866	Oct. 6
CORTELYOU, GEORGE BRUCE, U.S. statesman and industrialist	July 26, 1862	Oct 23
COSDEN, JOSHUA S., U.S. oil producer	July 8, 1882	Nov. 16
COTTER, REV. WILLIAM TIMOTHY, Roman Catholic bishop of Portsmouth, England	1866	Oct. 24
COWIE, DR. DAVID MURRAY, U.S. pediatrician	Nov. 19, 1872	Jan. 27
COWLES, MRS. JOSIAH EVANS, U.S. women's club leader	Mar. 13, 1858	July 4
COX, DOUGLAS FARLEY, U.S. insurance executive	Jan. 28, 1867	Apr. 9
CRAIGAVON, JAMES CRAIG, 1ST VISCOUNT, Irish statesman	Jan. 8, 1871	Nov. 24
CRAMER, STUART WARREN, U.S. manufacturer	Mar. 31, 1868	July 2
CRAVATH, PAUL DRENNAN, U.S. lawyer	July 14, 1861	July 1
CRAWFORD, MORRIS BARKER, U.S. physicist	Sept. 26, 1852	Oct. 9
CRAWSHAW, WILLIAM HENRY, U.S. educator	Nov. 6, 1861	July 2
CRICHTON, JOHN HENRY GEORGE, 5TH EARL OF ERNE.	Nov. 22, 1907	June 1
CROCKETT, DR. WILLIAM GOGGIN, U.S. pharmacist	Jan. 9, 1888	Oct. 29
CROMPTON, ROOKES EVELYN BELL, British engineer	May 31, 1845	Feb. 15
CROSS, ARTHUR LYON, U.S. educator	Nov. 14, 1873	June 21
CROWE, THOMAS BENNETT, U.S. engineering consultant	Sept. 6, 1876	Nov. 13
CULLEN, DR. GLENN ERNEST, U.S. pediatrist	Apr. 1, 1890	Apr. 11
CUNDALL, HERBERT MINTON, British civil servant and historian	Aug. 25, 1848	May 30
CURETON, CALVIN MAPLES, U.S. judge	Sept. 1, 1874	Apr. 8
CURLEY, EDWARD WALTER, U.S. congressman	May 23, 1873	Jan. 6
DAMON, LINDSAY TODD, U.S. educator	Nov. 8, 1871	May 6

Name	Birth date	Death date
*DANIELS, ARTHUR HILL, U.S. educator	Oct. 19, 1865	Apr. 2
D'ARNAULD DE VITROLLES, BARON REGIS, French diplomat	Nov. 19, 1877	Oct. 1
*DAUDET, JULIE ALLARD, French author	1847	Apr. 23
DAVENPORT, JAMES SANFORD, U.S. judge	Sept. 21, 1864	Jan. 3
DAVIES, MEURIG LLOYD, Canadian manufacturing chemist	Oct. 3, 1865	Dec. 17
*DAVIES, WILLIAM HENRY, British poet	Apr. 20, 1871	Sept. 26
D'AVIGDOR-GOLDSMID, SIR OSMOND ELIM, Anglo-Jewish philanthropist	1877	Apr. 14
DAVIS, PHILIP HALDANE, U.S. professor	Mar. 10, 1902	Feb. 20
DAVISON, CHARLES, British seismologist	May 1, 1858	Apr. 28
*DAWES, RUFUS CUTLER, U.S. financier	July 30, 1867	Jan. 8
DAY, GEORGE CALVIN, U.S. rear admiral	Nov. 8, 1871	Nov. 3
DAY, SARAH J., U.S. poet	Nov. 5, 1860	May 11
DE BARENNE, JOANES GREGORIUS DUSSER, Dutch-U.S. psychiatrist	June 6, 1885	June 9
DE BATHE, SIR HUGO GERALD, British husband of Lily Langtry	Aug. 10, 1871	July 15(?)
DEETJEN, DR. CHRISTIAN, U.S. X-ray specialist	1863	Dec. 28
DE KOK, JOHAN EGBERT FREDERIK, Dutch industrialist	1882	Oct. 28
DELL, ROBERT, British journalist	(?)	July 20
*DENEEN, CHARLES SAMUEL, ex-U.S. senator	May 4, 1863	Feb. 5
DENISON, SIR HUGH ROBERT, Australian publisher	Nov. 11, 1865	Nov. 23
*DE SCHWEINITZ, PAUL, U.S. Moravian bishop	Mar. 16, 1863	Feb. 8
DES GRAZ, SIR CHARLES LOUIS, British diplomat	Mar. 2, 1860	Oct. 24
*DE TUCIĆ, SERGE, Croatian playwright	1873	Sept. 25
DHARMENDRASINHJI, SHRI, THAKORE SAHEB, ruler of Rajkot, India	1910(?)	June 12
DIAL, NATHANIEL BARKSDALE, ex-U.S. senator	Apr. 24, 1862	Dec. 11
DIBBLE, CHARLES LEMUEL, U.S. lawyer	Nov. 30, 1881	Oct. 30
DIEHL, AMBROSE NEVIN, U.S. steel manufacturer	Oct. 20, 1876	Jan. 3
DILLARD, JAMES HARDY, U.S. educator	Oct. 24, 1856	Aug. 2
DOBSON, CHARLES CONGREVE, British rear admiral	1885	June 26
*DODD, WILLIAM EDWARD, U.S. professor and ambassador	Oct. 21, 1869	Feb. 9
*DOERPFELD, WILHELM, German archaeologist	Dec. 26, 1853	Apr. 26
*DOLMETSCH, ARNOLD, French musician	Feb. 24, 1858	Feb. 29
DONALDSON, BRUCE M., U.S. educator	Feb. 9, 1891	Jan. 12
DORNAY, LOUIS, Dutch tenor	1876	Aug. 12
DOUGHERTY, CHARLES A., U.S. utilities official	1878(?)	Dec. 20
DOUGLAS-HAMILTON, ALFRED DOUGLAS, DUKE OF HAMILTON AND BRANDON, premier peer of Scotland	Mar. 6, 1862	Mar. 16
DOWELL, CASSIUS, C., U.S. congressman	Feb. 29, 1864	Feb. 4
DOWLING, REV. JOHN PIUS, Catholic archbishop of the Port of Spain	June 23, 1860	June 6
DOWNIE, JOHN WALLACE, South African statesman	1876	Aug. 22
DOWNS, LAWRENCE ALOYSIUS, U.S. railroad official	May 9, 1872	Aug. 10
DOYLE, MRS. ARTHUR CONAN, widow of Sir Arthur	(?)	June 27
DROSSAERTS, REV. ARTHUR JEROME, archbishop of San Antonio, Tex.	Sept. 11, 1862	Sept. 8
DRUSHEL, J. ANDREW, U.S. educator	Nov. 24, 1872	June 20
DU BOSE, CHARLES GILBERT, U.S. industrialist	Mar. 22, 1870	Dec. 23
DUGAN, RAYMOND SMITH, U.S. astronomer	May 30, 1878	Aug. 31
DUGAN, BRIG. GEN. THOMAS BUCHANAN, U.S. soldier	July 27, 1858	Apr. 27
DUNLAP, CHARLES KEPHART, U.S. railway executive, retired	Apr. 8, 1863	Feb. 4
DURET, MIGUEL LANZ, Mexican journalist	1880	Nov. 21
DUVEEN, CHARLES J., British-U.S. antique furniture dealer	1872(?)	July 21
ECHOLS, CHARLES PATTON, U.S. soldier	Sept. 6, 1867	May 21
*EDEY, BIRDSALL OTIS, U.S. Girl Scout leader	June 25, 1872	Mar. 17
EGERTON, SIR GEORGE LE CLERC, British admiral	Oct. 17, 1852	Mar. 30
EHRENFELD, FREDERICK, U.S. geologist	1872 (?)	Aug. 10
*EISEN, GUSTAVUS AUGUSTUS, Swedish-U.S. scientist	Aug. 2, 1847	Oct. 29
*ELLERMAN, FERDINAND, U.S. astronomer	May 13, 1809	Mar. 20
ELLIOT, SIR FRANCIS, British diplomat	Mar. 24, 1851	Jan. 20
*ELLIOTT, MAXINE, U.S. actress	Feb. 5, 1871	Mar. 5
ELLIOTT, REV. WILLIAM THOMPSON, British canon	Nov. 15, 1880	June 20
ELLSWORTH, JAMES DRUMMOND, U.S. telephone executive	Oct. 14, 1863	June 13
ERNSBERGER, MILLARD CLAYTON, U.S. professor	June 12, 1866	Jan. 25
*ESTIGARRIBIA, JOSÉ FELIX, president of Paraguay	Jan. 21, 1888	Sept. 7
EVANS, EARLE WOOD, U.S. lawyer	Feb. 27, 1873	July 30
*EYDE, SAMUEL, Norwegian chemist	Oct. 29, 1866	June (?)
FAISON, SAMSON LANE, U.S. brigadier general	Nov. 29, 1860	Oct. 17
FALK, OTTO HERBERT, U.S. industrialist and soldier	June 18, 1865	May 21
FANTUS, DR. BERNARD, U.S. physician	Sept. 1, 1874	Apr. 14
FARMER, DR. THOMAS P., U.S. gynaecologist	May 10, 1883	Apr. 12
FARRELL, CHARLES LEROY, U.S. banker	Nov. 14, 1874	Aug. 25
FAULKNER, HERBERT WALDRON, U.S. artist and botanist	Oct. 8, 1860	Mar. 27
FAULKNER, ROLAND POST, U.S. statistician	Apr. 14, 1866	Nov. 27
FAUTEUX, GUILLAUME ANDRÉ, Canadian senator	1874	Sept. 10
*FAVERSHAM, WILLIAM, British-U.S. actor	Feb. 12, 1868	Apr. 7
FERRIS, HARRY BURR, U.S. professor of anatomy	May 21, 1865	Oct. 12
FERRY, E. HAYWARD, U.S. banker	June 14, 1864	Apr. 4
*FEW, WILLIAM PRESTON, U.S. educator	Dec. 20, 1867	Oct. 16
FINDLEY, ALVIN IRWIN, U.S. publisher	June 29, 1859	Dec. 12
*FINLEY, JOHN HUSTON, U.S. educator and editor	Oct. 19, 1863	Mar. 7
FISCHER, ISRAEL FREDERICK, U.S. customs court judge, retired	Aug. 17, 1858	Mar. 16
*FISHER, HERBERT ALBERT LAURENS, British historian	Mar. 21, 1865	Apr. 17
*FISHER, JOHN STUCHELL, U.S. state governor	May 25, 1867	June 25
FITCH, DR. CLIFFORD PENNY, U.S. veterinarian	July 1, 1884	Jan. 11
*FITZGERALD, FRANCIS SCOTT KEY, U.S. author	Sept. 24, 1896	Dec. 21
FITZGERALD, DR. JOHN GERALD, Canadian physician	Dec. 9, 1882	June 20
FITZHUGH, GUSTON THOMAS, U.S. lawyer	Aug. 31, 1866	Jan. 16
FITZMAURICE, GEORGE, U.S. motion picture director	Feb. 13, 1895	June 13
FLEMING, ADRIAN SEBASTIAN, U.S. brigadier general	Dec. 6, 1872	Dec. 1
FLEMING, ARTHUR HENRY, U.S. lumber manufacturer	Apr. 3, 1856	Aug. 11
FLICK, REUBEN JAY, U.S. industrialist	June 24, 1871	Aug. 24
FORBES, SIR GEORGE STUART, British Indian administrator	Oct. 27, 1849	Apr. 18
FORBES, REV. JOSEPH GUILLAUME, Catholic archbishop of Ottawa	Apr. 10, 1865	May 22
FOSTER, WILLIAM EDWARD, U.S. sugar refiner	Sept. 26, 1864	Aug. 8
FOX, JOHN MCDILL, U.S. lawyer	Jan. 3, 1891	Apr. 18
*FRANK, GLENN, U.S. educator and publicist	Oct. 1, 1887	Sept. 15
FRANKENTHALER, ALFRED, U.S. judge	Sept. 24, 1881	Jan. 7
FRAZER, SPAULDING, U.S. lawyer	Oct. 7, 1881	Mar. 7
FREEMAN, REV. ROBERT, U.S. clergyman	Aug. 4, 1878	June 28
FRENCH, HOLLIS, U.S. consulting engineer	June 26, 1868	Nov. 21
*FRIEDRICH KARL, LANDGRAVE OF HESSE, Germany	May 1, 1868	May 29
*FROHMAN, DANIEL, U.S. theatrical manager	Aug. 22, 1851	Dec. 20
FULLER, SIR GEORGE WARBURTON, Australian statesman	Jan. 22, 1861	July 22

Name	Birth date	Death date
Funk, Frank Hamilton, ex-U.S. congressman	Apr. 5, 1869	Nov. 24
Furness, Viscount Marmaduke, English industrialist	Oct. 29, 1883	Oct. 7
Fynn, Sir Percival Donald Leslie, southern Rhodesian statesman	Apr. 16, 1872	Apr. 25
Gair, George West, U.S. manufacturer	Aug. 10, 1872	July 21
Galli, Rosina, Italian danseuse	1895	Apr. 30
Galloway, Charles William, U.S. railway official	Dec. 11, 1868	Dec. 14
Ganfield, William Arthur, U.S. educator	Sept. 3, 1873	Oct. 18
Gardner, Hatfield, U.S. scout, known as "Arizona Bill"	1843	Jan. 28
*Garland, (Hannibal) Hamlin, U.S. author	Sept. 14, 1860	Mar. 4
Gates, William, U.S. archaeologist	1864	Apr. 21
*Gatti-Casazza, Giulio, Italian operatic director	Feb. 3, 1869	Sept. 2
Gaunt, Sir Ernest Frederick Augustus, British admiral	Mar. 25, 1865	Apr. 20
Gauthier, Rev. Joseph Alexandre Georges, archbishop of Montreal	Oct. 9, 1871	Aug. 31
Getchell, John Stirling, U.S. advertising expert	July 7, 1890	Dec. 17
*Gibbs, George, U.S. consulting engineer	Apr. 19, 1861	May 19
Gibbs, Willis Benjamin, U.S. congressman	Apr. 15, 1889	Aug. 7
*Gibson, Ernest Willard, U.S. senator	Dec. 29, 1871	June 20
Gilder, Robert Fletcher, U.S. archaeologist	Oct. 6, 1856	Mar. 7
*Gill, Eric Rowland, British sculptor	Feb. 22, 1882	Nov. 17
Gillespie, Lawrence Lewis, U.S. financier	Dec. 23, 1876	Feb. 7
Gilmore, Melvin Randolph, U.S. ethnologist	Mar. 11, 1868	July 25
*Gilmour, Sir John, British statesman	May 27, 1876	Mar. 30
*Glenn, Mary Willcox, U.S. welfare worker	Dec. 14, 1869	Nov. 3
Glennon, James Henry, U.S. rear admiral	1857	May 30
*Goldman, Emma, international anarchist	June 27, 1869	May 14
Goler, Dr. George W., U.S. physician	Aug. 24, 1864	Sept. 18
*Goma Y Tomas, Isidro, Spanish cardinal	Aug. 17, 1869	Aug. 22
Goodchild, Sir William Alfred Cecil, British economist	Nov. 7, 1885	Dec. 27
Goodenough, Sir Francis William, British gas company executive	1872	Jan. 12
*Goodrich, James Putnam, U.S. state governor	Feb. 18, 1864	Aug. 15
Gordon, John Sloan, Canadian artist	1868	Oct. 12
Grahame, Sir George Dixon, British diplomat	Apr. 28, 1873	July 9
Grant, Robert, U.S. author	Jan. 24, 1852	May 19
Graves, Rev. Frederick Rogers, U.S. missionary	Oct. 24, 1858	May 17
*Graves, William Sydney, U.S. major general	Mar. 27, 1865	Feb. 27
Gray, Arthur, British educator	Sept. 28, 1852	Apr. 12
Greene, Frank Russell, U.S. artist	Apr. 16, 1856	Jan. 20
Greene, Homer, U.S. author	Jan. 10, 1853	Nov. 26
Greenway, Rev. Walter Burton, U.S. educator	Aug. 18, 1876	Dec. 21
Grendal, Vladimir, Russian general	1883	Nov. 16
*Grenfell, Sir Wilfred Thomason, British medical missionary	Feb. 28, 1865	Oct. 9
Grevstad, Nicolay Andrew, Norwegian-U.S. journalist	June 2, 1851	Feb. 20
Griffin, Nathaniel Edward, U.S. author	Mar. 5, 1873	Aug. 25
Griswold, Augustus H., U.S. telegraph official	Sept. 29, 1879	Feb. 24
Griswold, Glenn, ex-U.S. congressman	Jan. 20, 1890	Dec. 5
Gronau, Hans von, German general	Feb. 6, 1850	Feb. 23
Gruppe, Charles Paul, U.S. artist	Sept. 3, 1860	Sept. 30
*Guillaumat, Marie Louis Adolphe, French soldier	Jan. 4, 1863	May 18
Gulliver, Julia Henriette, U.S. educator	July 30, 1856	July 26
Gunter, Julius Caldeen, ex-gov. of Colorado	Oct. 31, 1858	Oct. 28
Guthrie, William Buck, U.S. educator	Sept. 8, 1869	Nov. 6
Hachette, René, French senator	Mar. 26, 1886	Aug. 20
Haddon, Alfred Cort, British anthropologist	May 24, 1855	Apr. 20
*Hadfield, Sir Robert Abbott, British metallurgist	Nov. 29, 1858	Sept. 30
*Haggard, Dr. William David, U.S. surgeon	Sept. 28, 1872	Jan. 28
*Hagner, Dr. Francis Randall, U.S. genito-urinary surgeon	Feb. 19, 1873	July 7
*Hainisch, Michael, ex-president of the Austrian republic	Aug. 15, 1858	Feb. 29
Hamilton, Frederick William, U.S. educator	Mar. 30, 1860	May 22
Hamilton, George Livingstone, U.S. educator	July 24, 1874	Sept. 25
Hamlin, Clarence Clark, U.S. lawyer and publisher	Jan. 7, 1868	Oct. 29
Hammond, Aubrey Lindsay, British artist	Sept. 18, 1893	Mar. 19
Hammond, Creed Cheshire, U.S. major general	Oct. 9, 1874	Apr. 2
Hammond, Edward P., U.S. industrialist	Aug. 3, 1884	May 28
Hannay, Robert Kerr, royal historiographer in Scotland	1867	Mar. 19
*Hanson, Ole, U.S. real estate operator	Jan. 6, 1874	July 6
Harada, Tasuku, Japanese Christian educator	Nov. 10, 1863	Feb. 22
Hardy, Ashley Kingsley, U.S. educator	Apr. 6, 1871	July 29
*Harington, Sir Charles Harington, British general	May 31, 1872	Oct. 22
*Harkness, Edward Stephen, U.S. philanthropist	Jan. 22, 1874	Jan. 29
Harriman, Oliver, U.S. broker	Nov. 29, 1862	Aug. 14
*Harrington, Francis Clark, U.S. administrator of WPA	Sept. 10, 1887	Sept. 30
Harrison, William Preston, U.S. art patron	Apr. 12, 1809	June 28
Hartwell, Dr. John Augustus, U.S. surgeon	Sept. 27, 1809	Nov. 30
Haslam, Sir John, British statesman	Feb. 27, 1878	May 21
Hastings, Charles Douglas, U.S. motor car manufacturer	Aug. 25, 1858	Aug. 7
Hawkes, Dr. Forbes Robert, U.S. surgeon	Aug. 25, 1865	Aug. 24
Hawkins, George Knight, U.S. educator	Dec. 16, 1862	Feb. 24
Hay, Charles John Bruce, British major general	May 18, 1877	Sept. 19
Hayden, Dr. Austin Albert, U.S. physician	Oct. 15, 1881	July 10
Haynes, Frederick J., U.S. automobile manufacturer	1871	May 3
Haynes, Roy Asa, ex-U.S. commissioner of prohibition	Aug. 31, 1881	Oct. 20
Hays, Dr. Harold M., U.S. physician	Sept. 26, 1880	Aug. 20
*Head, Sir Henry, British neurologist	Aug. 4, 1861	Oct. 9
Heath, William Ames, U.S. banker	June 29, 1862	July 12
*Heidenstam, Carl Gustaf Verner von, Swedish author	July 6, 1859	May 20
Heinke, George H., U.S. congressman	July 22, 1882	Jan. 2
Heming, Arthur, Canadian artist	1870	Oct. 30
Henke, Alfred, German aviator	1902	Apr. 22
*Hering, Hermann S., U.S. Christian Scientist lecturer	Aug. 24, 1864	May 15
Herrick, Francis Hobart, U.S. biologist	Nov. 19, 1858	Sept. 11
Hertz, Emanuel, U.S. collector of Lincolniana	Sept. 2, 1870	May 23
Hesse, Andre, French statesman	(?)	Dec. 18
*Heyward, DuBose, U.S. author	Aug. 31, 1885	June 16
Hickey, Rev. Thomas F., Roman Catholic archbishop of Rochester, N. Y.	1866	Dec. 10
*Hill, Dr. Eben Clayton, U.S. roentgenologist	Oct. 9, 1882	June 15
Hill, Dr. Emory, U.S. ophthalmologist	Sept. 8, 1883	Dec. 4
Hill, Howard Copeland, U.S. educator	Dec. 20, 1878	June 25
Hill, Rev. William Edwin, U.S. clergyman	June 20, 1880	Apr. 23
Hill, William Joseph (Billy), U.S. song writer	1898	Dec. 24
Hinsdale, Dr. William Graham, U.S. physician	1862 (?)	July 15
Hitz, Ralph, U.S. hotel manager	Mar. 1, 1891	Jan. 12
Hobson, John Atkinson, British economist	July 6, 1858	Apr. 1
Hogan, Michael J., ex-U.S. congressman	Apr. 22, 1871	May 7
Holden, Hale, U.S. railway official	Aug. 11, 1869	Sept. 2
*Hollander, Jacob H., U.S. economist	July 23, 1871	July 6
Hollister, Clay Harvey, U.S. banker	Oct. 7, 1863	Feb. 18
Holm, Gustav, Danish explorer	1849	Mar. 12
Homan, Harry Elmer, U.S. cartoonist	1889 (?)	July 20
Hooker, James Murray, ex-U.S. congressman	Oct. 29, 1873	Aug. 6
*Hooper, Franklin Henry, U.S. editor	Jan. 28, 1862	Aug. 14
Hopkins, Louis Bertram, U.S. educator	Aug. 11, 1881	Aug. 10
Horlick, William, U.S. philanthropist	Dec. 12, 1875	Apr. 1
Horn, Henry John, U.S. railway official	1864	Dec. 29
*Horne, Robert Stevenson Horne, 1st Viscount, British statesman	Feb. 28, 1871	Sept. 3
*Horner, Henry, governor of Illinois	Nov. 30, 1878	Oct. 6
Horter, Earle, U.S. etcher	Dec. 8, 1883	Mar. 20
*Houston, David Franklin, U.S. economist and statesman	Feb. 17, 1866	Sept. 2
Houston, Mrs. David Franklin, U.S. welfare worker	Sept. 23, 1873	Jan. 22
Howard, Frederick Aydelotte, U.S. banker	Oct. 20, 1855	Feb. 6
Howden, Rev. Frederick Bingham, U.S. Episcopal bishop	Dec. 10, 1869	Nov 12
*Howe, Frederic Clemson, U.S. lawyer	Nov. 21, 1867	Aug. 3
Howell, Charles Frederick, U.S. naval officer	1881 (?)	July 20
Huckel, Rev. Oliver, U.S. clergyman	Jan. 11, 1864	Feb. 3
Hughes, Edward Everett, U.S. steel executive	Mar. 14, 1862	Jan. 19
Hughes, James Fredric, ex-U.S. congressman	Aug. 7, 1883	Aug. 9
Huidekoper, Frederic Louis, U.S. military writer	Mar. 8, 1874	Mar. 7
Huling, Sara Hawks, U.S. club woman	Jan. 23, 1872	Oct. 11
Hull, Vincent Kingsley, U.S. steamship executive	Apr. 11, 1881	Aug. 19
Hutton, James Morgan, U.S. financier	Feb. 21, 1870	Mar. 1
*Hutton, Maurice, Canadian educator	1856	Apr. 5
Hydari, Lady Amena, Indian feminist	(?)	June 15
Inculet, Ion, Rumanian statesman	(?)	Nov. 19
Ionescu, Nae, Rumanian journalist	1890	Mar. 15
Iorga, Nicolae, ex-Rumanian premier	June 18, 1871	Nov. 28
Irias, Julian, Nicaraguan statesman	1873	Nov. 20
Irvine, Benjamin Franklin, U.S. editor	1863	May 1
*Jabotinsky, Vladimir, Russian Zionist	1880	Aug. 3
Jacobs, Joseph, U.S. boxing promoter	May 7, 1896	Apr. 24
Jacoby, Dr. George W., U.S. neurologist	Sept. 1856	Sept. 11
Jenkins, Frederick Warren, U.S. librarian	Jan. 22, 1878	Apr. 11
Jenkins, MacGregor, U.S. author	Apr. 14, 1869	Mar. 6
Jewett, Thomas Scovell, U.S. rear admiral	1866	Nov. 17
Joel, Jack Barnato, British financier	Sept. 29, 1862	Nov. 13
Johnson, Arthur Newhall, U.S. engineer	Nov. 11, 1870	July 11
Johnston, John Alexander, U.S. army officer	Feb. 22, 1858	Jan. 5
Jones, Grover, U.S. motion picture scenario writer	1893	Sept. 22
Jones, Horace Conrad, U.S. banker	June 16, 1857	Aug. 20
Jones, James Sumner, U.S. soldier and industrialist	Apr. 23, 1881	Aug. 17
Jones, Norman L., chief justice of Illinois	Sept. 19, 1870	Nov. 15
Joyce, Ernest Edward Mills, British antarctic explorer	1875	May 2
*Kallió, Kjösti, ex-president of Finland	1873	Dec. 19
*Kantorowicz, Hermann, exiled German scholar	Nov. 18, 1877	Feb. 12
Karn, Frederick James, British musician	Aug. 29, 1862	Dec. 4
Kaup, Rev. Felix F., U.S. clergyman	June 8, 1879	Mar. 18
Kaupas, Casimira, Mother Marie, founder of the Sisters of St. Casimer in the U.S.	Jan. 6, 1880	Apr. 17
Kearton, Cherry, British naturalist	July 8, 1871	Sept. 27
Keith, Dora Wheeler, U.S. portrait artist	Mar. 12, 1857 (?)	Dec. 27
Kellogg, Frederick William, U.S. publisher	Dec. 7, 1866	Sept. 5
Kelly, Rev. Michael, archbishop of Sydney, Australia	Feb. 13, 1850	Mar. 8
Kenney, William Francis, U.S. journalist	1867 (?)	Aug. 9
Kent, Russell, U.S. journalist	July 5, 1885	Oct. 30
Kerr, Duncan John, U.S. railroad official	Dec. 3, 1883	Oct. 8
Kienlin, Albert von, German diplomat, retired	1878	Jan. 11
Kimball, Wilbur R., U.S. inventor	1863 (?)	July 29
Kirby, Fred Morgan, U.S. capitalist	Oct. 30, 1861	Oct. 16
Kirby, John Henry, U.S. lumberman	Nov. 16, 1860	Nov. 9
Klee, Paul, Swiss painter	1879(?)	June 30
Kloeckner, Peter, German industrialist	Nov. 9, 1863	Oct. 5
Knight, Charles Y., U.S. inventor	1868	May 4
*Knopf, Dr. S. Adolphus, U.S. physician	Nov. 27, 1857	July 15
Knower, Dr. Henry McElderry, U.S. anatomist	Aug. 5, 1868	Jan. 10
Koch, Theodor, German sea captain	July 10, 1879	Oct. 29
Koerner, William, U.S. mining engineer	Feb. 22, 1886	June 30
*Kohler, Walter Jodok, U.S. industrialist	Mar. 3, 1875	Apr. 21
Koroshetz, Rev. Anton, ex-premier of Yugoslavia	1872	Dec. 14
Kramer, Dr. Simon Pendleton, U.S. surgeon	Jan. 1, 1868	Apr. 12
Krause, Dr. Otto G., U.S. dentist	July 4, 1876	Jan. 30
Kremer, J. Bruce, U.S. lawyer	Sept. 26, 1878	July 23
Kress, Claude Washington, U.S. merchant	Apr. 4, 1876	Nov. 18
*Kubelik, Jan, Bohemian violinist	1880	Dec. 5
Kurucz, John, Hungarian-U.S. pianist	1883 (?)	July 22
Kusunoki, Nobuichi, Japanese major general	(?)	Nov. 29
*Lagerlof, Selma, Swedish novelist	Nov. 20, 1858	Mar. 16
*Laidlaw, Sir Patrick Playfair, British pathologist	Sept. 26, 1881	Mar. 20
Lake, Sir Percy Henry Noel, British general	June 29, 1855	Nov. 16
Lamarche, Rev. Charles Antonelli, Canadian bishop	Oct. 26, 1870	Jan. 29
Lamington, Lord, British colonial administrator	July 29, 1860	Sept. 17
Langdale, Rev. John William, U.S. clergyman	Aug. 14, 1874	Dec. 10
*Lansbury, George, British labour leader	Feb. 21, 1859	May 7
Latham, Orval Ray, U.S. educator	Apr. 13, 1890	July 9
Latta, Robert, Canadian sea captain	1872	Nov. 5
*Lavedan, Henri Léon Émile, French dramatist	1859	Aug. 7
Lawford, Ernest, British-U.S. actor	1870(?)	Dec. 27
Lawrence, C. E., British author and playwright	Dec. 24, 1870	Mar. 15
Lawrence, Sir Walter Roper, British civil servant	Feb. 9, 1857	May 25
Lawson, Roberta Campbell, U.S. club woman	1856(?)	Dec. 30
Laycock, Craven, U.S. educator	Sept. 30, 1866	Apr. 4
Lazell, Frederick J., U.S. educator	1868 (?)	Sept. 23
Lee, Rev. John Clarence, U.S. educator	Oct. 15, 1856	Sept. 16
Leech, Sir Joseph William, British surgeon and member of parliament	1865	May 30
*Levene, Phoebus Aaron (Theodore), U.S. biochemist	Feb. 25, 1869	Sept. 6
Lever, Asbury Francis, U.S. legislator	Jan. 5, 1875	Apr. 28
Lewis, Albert Buell, U.S. anthropologist	June 21, 1867	Oct. 10
Lewis, Sir Alfred Edward, British economist	Aug. 2, 1868	Feb. 21
*Lewis, Francis Park, U.S. ophthalmologist	May 19, 1855	Sept. 10
Lichtenberger, André, French author	1870	Mar. 25
*Lie, Jonas, U.S. artist	Apr. 29, 1880	Jan. 10
*Lindley, Ernest Hiram, U.S. educator	Oct. 2, 1869	Aug. 23
*Lippincott, Joshua Bertram, U.S. publisher	Aug. 24, 1857	Jan. 16
Llewellyn, Sir David Richard, 1st Baronet, Welsh coal operator	Mar. 9, 1879	Dec. 15

Name	Birth date	Death date
OCKE, REV. CHARLES EDWARD, U.S. Methodist bishop, retired	Sept. 9, 1858	Mar. 4
ODGE, SIR OLIVER (JOSEPH), British scientist	June 12, 1851	Aug. 22
OEFGREN, ELIE, Swedish statesman	1861	Apr. 8
ORAM, CHARLES TEMPLEMAN, British-U.S. educator	May 10, 1879	July 8
OREE, LEONOR FRESNEL, U.S. railroad president	Apr. 23, 1858	Sept. 6
ORILLARD, PIERRE, U.S. capitalist	Jan. 28, 1860	Aug. 6
OTHIAN, PHILIP HENRY KERR, 11TH MARQUESS OF, British diplomat	Apr. 18, 1882	Dec. 12
OVETT, REV. WILLIAM CUYLER, U.S. religious editor	Nov. 28, 1852	July 1
OWELL, SHERMAN JAMES, ex-U.S. tariff commissioner	May 28, 1858	Feb. 3
OWMAN, SEYMOUR, U.S. lawyer	Oct. 7, 1868	Mar. 13
OWTHER, SIR HENRY CECIL, British major general	Jan. 27, 1869	Dec. 10
UNDEEN, ERNEST, U.S. senator	1878	Aug. 31
UQUIENS, FREDERICK BLISS, U.S. educator	Dec. 10, 1875	Apr. 17
YON, GEORGE F., former U.S. judge	July 13, 1849	May 21
YTE, SIR HENRY CHURCHILL MAXWELL, British historian	May 20, 1848	Oct. 29
IACARTHUR, JOHN R., U.S. engineer	July 24, 1862	Nov. 30
IACBETH, ROBERT WALKER, U.S. art dealer	1884 (?)	Aug. 1
IACBRIDE, ERNEST WILLIAM, British biologist	Dec. 12, 1866	Nov. 19
ICCARL, JOHN RAYMOND, ex-U.S. comptroller general	Nov. 27, 1879	Aug. 2
ICCLACHLAN, JAMES, ex-U.S. congressman	Aug. 1852	Nov. 21
ICCLELLAN, GEORGE BRINTON, U.S. publicist	Nov. 23, 1865	Nov. 30
ICCORMICK, REV. WILLIAM PATRICK GLYN, British royal chaplain	June 14, 1877	Oct. 16
ICCULLOCH, RICHARD, U.S. utilities executive	June 3, 1869	Aug. 28
IACDONALD, EDWARD MORTIMER, Canadian statesman	Aug. 16, 1865	May 25
IACDONALD, SIR GEORGE, Scotch numismatist and antiquarian	1862	Aug. 11
	1898	Jan. 8
ICDUFFEE, FRANKLIN, U.S. poet and teacher	1863	Nov. 5
ICGARRAH, GATES W., U.S. banker	1874 (?)	Aug. 5
ICGARRITY, JOSEPH, Irish patriot	July 9, 1887	Sept. 16
ICGUIRE, WILLIAM ANTHONY, U.S. playwright	Apr. 12, 1868	July 8
ICKEEVER, WILLIAM ARCH, U.S. lecturer and author	Feb. 3, 1885	May 6
ICKENZIE, RODERICK DUNCAN, U.S. educator	Dec. 1, 1865	Jan. 25
ICMURRAY, CHARLES BACKMAN, U.S. banker	Dec. 21, 1863	May 1
ICRAE, JAMES HENRY, U.S. soldier	Sept. 2, 1865	Apr. 2
IANLY, JOHN MATTHEWS, U.S. educator		
IANNERS, JOHN HENRY MONTAGUE, 9TH DUKE OF RUTLAND	Sept. 21, 1886	Apr. 21
IANSELL-MOULLIN, DR. CHARLES WILLIAM, British surgeon	Oct. 1851	Nov. 10
IANSFIELD, BEATRICE CAMERON, U.S. actress, widow of Richard Mansfield	1868	July 12
IARCH, JOHN, Roman Catholic bishop of Harbor Grace, Newfoundland	1863	Jan. 12
IARCHESI, BLANCHE (BARONNE CACCAMISI), Italo-German opera singer	Apr. 4, 1863	Dec. 15
IARGOLIOUTH, DAVID SAMUEL, British Arabic scholar	Oct. 17, 1858	Mar. 23
IARINIS-STENDARDO, ALBERTO DE, Italian senator	1868	Oct. 13
IARKHAM, EDWIN, U.S. poet and lecturer	Apr. 23, 1852	Mar. 7
IARLER, SIR HERBERT MEREDITH, Canadian diplomat	Mar. 7, 1876	Jan. 31
IARSH, FRANK BURR, U.S. educator	Mar. 4, 1880	June 1
IARTIN, EDGAR STANLEY, U.S. Boy Scout official	Mar. 8, 1873	Aug. 9
IARVIN, HARRY NORTON, U.S. inventor of the biograph	1862	Jan. 12
IASON, EDWARD PALMER, U.S. piano manufacturer	1859 (?)	July 17
IATSON, GEORGE CHARLTON, U.S. geologist	Feb. 4, 1873	Jan. 3
IATTHEWS, REV. MARK ALLISON, U.S. clergyman	Sept. 24, 1867	Feb. 5
IAXWELL, JOHN, British motion picture producer	1877 (?)	Oct. 3
IAYO, KATHERINE, U.S. author	1867 (?)	Oct. 9
IEECH, THOMAS COX, British journalist	1861	Oct. 21
IELLER, SIR RICHARD JAMES, British statesman	1872	June 23
IELLOR, WALTER, U.S. architect	Apr. 25, 1880	Jan. 11
IENDENHALL, REV. HARLAN GEORGE, U.S. clergyman	Apr. 12, 1851	May 15
IENOCAL, FAUSTO, Cuban ex-senator	1879	Oct. 30
IETCALF, DR. HAVEN, U.S. plant pathologist	Aug. 6, 1875	May 24
IICHELIN, EDOUARD, French manufacturer	1859	Aug. 25
IILLAR, REV. ALEXANDER COPELAND, U.S. clergyman	May 17, 1861	Nov. 9
IILLER, FRANKLIN THOMAS, U.S. publisher, retired	Apr. 15, 1873	Jan. 29
IILLER, JAMES COLLINS, U.S. educator	June 18, 1880	Sept. 30
IILLER, SAMUEL WARREN, U.S. soldier	Feb. 10, 1857	Apr. 21
IILLER, WILLIAM LASH, Canadian chemist	1866	Sept. 1
IILLER, WILLIAM WILSON, U.S. lawyer	May 14, 1870	July 16
IIX, TOM, U.S. motion picture actor	Jan. 6, 1880	Oct. 12
IODJESKI, RALPH, U.S. engineer	Jan. 27, 1861	June 26
IOLTEN, ROBERT POTTER, U.S. naval officer	Nov. 12, 1885	May 28
IOLYNEAUX, JOSEPH WEST, U.S. federal judge, retired	Dec. 12, 1863	Jan. 24
IONSON, BARON AUGUSTUS DEBONNAIRE JOHN, British diplomat	Sept. 22, 1868	Oct. 10
IONTEAGLE, LOUIS FINLAY, U.S. philanthropist	1856 (?)	July 16
IONTGOMERY, DR. WALTER CLARK, U.S. surgeon	May 19, 1878	Jan. 15
IOORE, JOHN DENIS JOSEPH, U.S. labour relations adviser	May 15, 1874	Oct. 1
IOORE, NATHANIEL DRUMMOND, U.S. industrialist	Oct. 5, 1880	May 18
IOORE, REV. T. ALBERT, Canadian United Church leader	June 29, 1860	Mar. 31
IORA, FRANCIS LUIS, U.S. artist	July 27, 1874	June 5
IOREING, ADRIAN CHARLES, British engineer	July 4, 1892	July 11
IORRIS, WILLIAM CHARLES, U.S. cartoonist	Mar. 6, 1874	Apr. 10
IORROW, MRS. HONORE WILLSIE, U.S. author	1880	Apr. 12
IORSE, DR. JOHN LOVETT, U.S. pediatrist	Apr. 21, 1865	Apr. 3
IORTON, JAMES MADISON, JR., U.S. jurist	Aug. 24, 1869	June 26
IOSCOVICH, MAURICE, Russian-U.S. actor	Nov. 23, 1871	June 18
IOSHER, DR. CLELIA DUEL, U.S. medical educator	Dec. 16, 1863	Dec. 22
IOTON, ROBERT RUSSA, U.S. Negro educator	Aug. 26, 1867	May 31
IOTTA, GIUSEPPE, Swiss scholar and statesman	Dec. 29, 1871	Jan. 23
IUCK, KARL, German musician	Oct. 22, 1859	Mar. 4
IUELLER, GEORGE ALEXANDER VON, German admiral	Mar. 24, 1854	Apr. 19
IUMFORD, ETHEL WATTS (MRS. P. G. GRANT), U.S. author	(?)	May 2
IUNDY, TALBOT, British-U.S. author	Apr. 23, 1879	Aug. 5
IURPHY, FRANKLIN WILLIAM, U.S. lawyer	Aug. 24, 1869	Nov. 22
IURPHY, FREDERICK E., U.S. newspaper publisher	Dec. 5, 1872	Feb. 14
IURRAY, AUGUSTUS TABER, U.S. professor	Oct. 29, 1866	Mar. 8
IYERS, FRANK KERCHNER, U.S. judge	Mar. 7, 1874	Aug. 2
IYERS, JEROME, U.S. artist	Mar. 20, 1867	June 19
IYSORE, MAHARAJAH OF, SRI KRISHNARAJAH WADIYAR BAHADUR, Indian ruler	June 4, 1884	Aug. 3
IAGEL, CHARLES, U.S. lawyer	Aug. 9, 1849	Jan. 5
IAKAMURA, UTAEMON, Japanese actor	1864	Sept. 11
IEAL, THOMAS, U.S. industrialist	Sept. 27, 1858	Oct. 6
IERSESSIAN (SEBOOH), ARSHAK, Armenian patriot	1874 (?)	July 31
IEVADA, EMMA, U.S. soprano	1862	June 20
IEWBOLT, SIR FRANCIS GEORGE, British attorney	Nov. 21, 1863	Dec. 7

Name	Birth date	Death date
NEWMAN, JOHN S., U.S. lawyer	May 7, 1870	July 23
*NEWTON, ALFRED EDWARD, U.S. manufacturer and author	Aug. 26, 1863	Sept. 29
NEZU, KAICHIRO, Japanese financier	1869	Jan. 4
NICKERSON, CARLETON BELL, Canadian educator	1885	Dec. 30
NIPKOW, PAUL GOTTLIEB, German inventor	Aug. 22, 1860	Aug. 24
*NIXON, LEWIS, U.S. shipbuilder	Apr. 7, 1861	Sept. 23
*NOBLE, GLADWYN KINGSLEY, U.S. herpetologist	Sept. 20, 1894	Dec. 9
NOLTING, WILLIAM GREANER, U.S. architect	Nov. 11, 1866	Nov. 24
*NORRIS, JAMES FLACK, U.S. chemist	Jan. 20, 1871	Aug. 3
*NORTHRUP, EDWIN FITCH, U.S. engineer	Feb. 23, 1866	Apr. 29
NORWOOD, EDWIN P., U.S. author	Apr. 20, 1881	Oct. 13
OBERTEUFFER, GEORGE, U.S. artist	1878	May 13
O'BRIEN, CHARLES F., ex-U.S. congressman	Mar. 7, 1879	Nov. 14
O'CONNOR, SIR TERENCE JAMES, British solicitor general	1891	May 8
OHL, HENRY, JR., U.S. labour leader	Mar. 16, 1873	Oct. 16
OLCOTT, JACOB VAN VECHTEN, ex-U.S. congressman	May 17, 1850	June 1
OLMSTED, GEORGE WELCH, U.S. utility executive	May 18, 1874	Jan. 15
O'NEIL, GEORGE, U.S. author	1898	May 24
*OWENS, ROBERT BOWIE, U.S. electrical engineer	Oct. 29, 1870	Nov. 1
PAGE, DEWITT, U.S. industrialist	Apr. 20, 1869	Feb. 28
PAGET, SIR RALPH SPENCER, British diplomat	Nov. 6, 1864	May 11
PAIGE, JAMES, U.S. professor	Nov. 22, 1863	Feb. 4
PALMER, ALBERT DEFOREST, U.S. physicist	July 26, 1869	Jan. 13
PARKER, HENRY WISE, British naval officer	June 15, 1875	Aug. 1
PARKINS, ALMON ERNEST, U.S. geographer	Jan. 10, 1879	Jan. 3
*PASTERNACK, JOSEF ALEXANDER, Polish-U.S. musician	1880	Apr. 29
*PATRICK, MARY MILLS, U.S. leader in women's education in the near east	Mar. 10, 1850	Feb. 25
PATTERSON, EDWARD WHITE, ex-U.S. congressman	Oct. 4, 1895	Mar. 7
PATTERSON, GAYLARD HAWKINS, U.S. educator	Aug. 18, 1866	June 5
PEARCE, GEORGE C., U.S. actor	1865	Aug. 12
*PEARL, DR. RAYMOND, U.S. biologist	June 3, 1879	Nov. 17
PEIRSE, SIR RICHARD HENRY, British admiral	Sept. 4, 1860	July 10
*PEIXOTTO, ERNEST CLIFFORD, U.S. artist	Oct. 15, 1869	Dec. 6
PELLEGRENI, ALDO, Italian general	1888	Dec. 7
PEPERE, ALBERTO, Italian educator	1875(?)	July 19
PERCY, HENRY GEORGE ALLEN, 9TH DUKE OF NORTHUMBERLAND	July 15, 1912	June 2
PERKINS, FREDERICK, U.S. brigadier general	Aug. 21, 1857	Apr. 25
*PERKINS, JAMES HANDASYD, U.S. banker	Jan. 11, 1876	July 12
PEYNADO, JACINTO BIENVENIDO, president of the Dominican republic	Feb. 15, 1878	Mar. 7
PHILIPPS, SIR IVOR, British soldier and industrialist	Sept. 9, 1861	Aug. 15
PHILLIMORE, SIR RICHARD FORTESCUE, British admiral	Dec. 23, 1864	Nov. 11
PHILLIPS, CHARLES JAMES, British-U.S. philatelist	May 16, 1863	June 2
PHINNEY, WILLIAM, U.S. actor	Mar. 28, 1877	July 24
PICK, BEHRENDT, German numismatist	Dec. 21, 1861	May 3
PIERCE, HENRY HILL, U.S. lawyer	Nov. 7, 1875	Mar. 18
PIERCE, LYMAN L., U.S. institutional financier	May 14, 1868	July 20
*PIERCE, PALMER EDDY, U.S. brigadier general	Oct. 23, 1865	Jan. 17
PIERCE, WALLACE E., U.S. congressman	Dec. 9, 1881	Jan. 3
PILES, SAMUEL HENRY, U.S. lawyer	Dec. 28, 1858	Mar. 11
PINTOR, PIETRO, Italian general	1880	Dec. 7
PIRIE, JOHN TAYLOR, U.S. dry goods merchant	Sept. 11, 1871	Feb. 25
*PITTMAN, KEY, U.S. senator	Sept. 19, 1872	Nov. 10
PIZZI, EMILIO, Italian composer	(?)	Nov. 27
POLACHEK, VICTOR HENRY, U.S. journalist	Aug. 24, 1876	June 11
POMERANTZ, ARNOLD, U.S. pianist	Mar. 21, 1921	Aug. 1
*POORE, BENJAMIN ANDREW, U.S. soldier	June 22, 1863	Aug. 27
POORE, HENRY RANKIN, U.S. artist	Mar. 21, 1859	Aug. 15
POST, WILLIAM STONE, U.S. architect	May 10, 1866	July 8
POTTER, ALFRED CLAGHORN, U.S. librarian	Apr. 4, 1867	Nov. 1
POTTER, WILLIAM W., U.S. judge	Aug. 1, 1869	July 21
PRALL, DAVID WIGHT, U.S. educator	Oct. 5, 1886	Oct. 21
PRENTISS, CAROLINE, U.S. poet	June 14, 1852	Mar. 27
PRITCHARD, DR. STUART, U.S. physician	Mar. 31, 1882	Aug. 4
PROBERT, FRANK HOLMAN, U.S. mining engineer	June 13, 1876	May 7
*PUSEY, DR. WILLIAM ALLEN, U.S. dermatologist	Dec. 1, 1865	Aug. 29
PUTTI, DR. VITTORIO, Italian orthopaedist	1880	Nov. 1
QUINN, REV. DANIEL JOSEPH, U.S. educator	May 24, 1864	Mar. 9
RAE, ARTHUR L., U.S. utility executive	Mar. 31, 1891	Apr. 14
RAGON, HEARTSILL, U.S. judge	Mar. 20, 1885	Sept. 15
RAJAWANGSAN, PHYA, Siamese minister to London	1886	Feb. 23
*RAUTENBURG, ROBERT, U.S. ecclesiastical sculptor	1857	Feb. 21
REED, EDWARD BLISS, U.S. educator	Aug. 19, 1872	Feb. 15
REED, EUGENE E., ex-U.S. congressman	1866	Dec. 15
REED, HERBERT CALHOUN, U.S. chemist	Oct. 16, 1873	July 25
REESE, CHARLES LEE, U.S. chemist	Nov. 4, 1862	Apr. 12
REILLEY, THOMAS THORNTON, U.S. judge	Mar. 20, 1883	Jan. 26
REISNER, REV. CHRISTIAN FICHTHORNE, U.S. clergyman	June 3, 1872	July 17
REVEL, BERNARD, U.S. educator	Sept. 17, 1885	Dec. 2
*REYNOLDS, GEORGE MCCLELLAND, U.S. banker	Jan. 15, 1865	Feb. 26
RHOADES, CORNELIA HARSEN (NINA RHOADES), U.S. author	Dec. 1, 1863	Nov. 28
RHOADES, THOMAS L., U.S. physician and army officer	Apr. 10, 1870	Aug. 20
RIAL, LOUISE, U.S. actress	1850	Aug. 10
RICE, JOHN HOGDEN, U.S. brigadier general	Jan. 6, 1870	Jan. 8
RICHARD, CHARLES, U.S. Army surgeon, retired	Nov. 10, 1854	Apr. 19
RICHARDS, FRANKLIN B., U.S. metallurgist	Nov. 12, 1862	Dec. 30
RICHARDSON, NORVAL, U.S. author	Oct. 8, 1877	Oct. 22
RICHARDSON, WALTER CORNELL, U.S. merchant	June 7, 1872	June 9
RICHMAN, CHARLES, U.S. actor	Jan. 12, 1870	Dec. 1
RICHMOND, CHARLES ALEXANDER, U.S. educator	Jan. 7, 1862	July 12
RIDGELY, HENRY, U.S. banker	Jan. 19, 1869	July 13
*RIESMAN, DR. DAVID, U.S. physician	Mar. 25, 1867	June 3
RIGGS, DR. AUSTEN FOX, U.S. psychiatrist	Dec. 12, 1870	Mar. 5
RIGLING, ALFRED, U.S. librarian	1868	Dec. 8
RIHANI, AMEEN, Syrian poet and publicist	1877	Sept. 14
ROBB, DR. HUNTER, U.S. gynaecologist	1863	May 15
ROBERTS, DANIEL C., U.S. philanthropist	Aug. 19, 1859	June 3
ROBERTS, FLORENCE, U.S. actress	Mar. 16, 1861	June 6
ROBERTS, GEORGE NEWMAN, U.S. industrialist	Dec. 17, 1874	Sept. 12
ROBINS, AUGUSTINE WARNER, U.S. soldier	Sept. 18, 1882	June 16
ROBINSON, THOMAS LINTON, U.S. banker	June 28, 1880	Feb. 20
RODGERS, JOHN HENRY, U.S. cotton merchant	May 2, 1864	Feb. 15
*RODMAN, HUGH, U.S. admiral	Jan. 6, 1859	June 7
RODRIGUEZ, NICHOLAS, Mexican fascist leader	(?)	Aug. 10
ROEMER, JOHN LINCOLN, U.S. educator	May 2, 1865	Aug. 9
ROGERS, JAMES HOTCHKISS, U.S. composer	Feb. 7, 1857	Nov. 28
ROGERS, JOSEPH BARTLETT, Canadian brigadier general	1886	Oct. 13
*ROGERS, NORMAN MCLEOD, Canadian statesman	July 25, 1894	June 10
RONARCH, PIERRE, French vice admiral	1865	Mar. 31

Name	Birth date	Death date
Rooney, Marion Bent, U.S. stage dancer	Dec. 23, 1879	July 28
Rosewater, Victor, U.S. journalist	Feb. 13, 1871	July 12
*Rosny, Joseph Henry (Joseph Boex), French novelist	1856	Feb. 14
Ross, Sir (Edward) Denison, British orientalist	June 6, 1871	Sept. 20
*Rostron, Sir Arthur Henry, British sea captain	May 14, 1869	Nov. 4
*Rothermere, Harold Sidney Harmsworth, 1st Viscount, British publisher	Apr. 26, 1868	Nov. 26
Rowan, Charles A., U.S. industrialist	Sept. 27, 1874	Sept. 13
Ruiz y Rodriguez, Rev. Manuel Damata, Cuban archbishop	1874	Jan. 3
Rumpler, Edmund, German aeroplane engineer	1872	Sept. 9
Rusby, Dr. Henry Hurd, U.S. botanist	Apr. 26, 1855	Nov. 18
Rushmore, David Barker, U.S. electrical engineer	Aug. 21, 1873	May 6
Russell, Dr. William, Scotch physician	1852	Aug. 12
*Sabry Pasha, Hassan, Egyptian premier	1879	Nov. 14
St. Aubyn, John Townshend (Baron St. Levan), British soldier	Sept. 23, 1857	Nov. 10
*Saionji, Prince Kimmochi, Japanese statesman	1849	Nov. 24
Sampsell, Marshall Emmett, U.S. lawyer	Feb. 28, 1874	Apr. 4
*Sandefer, Jefferson Davis, U.S. educator	Mar. 13, 1868	Mar. 22
Sandeman, Sir Nairne Stewart, British statesman	Oct. 12, 1876	Apr. 23
Sanford, Mrs. Lillias Rumsey, U.S. educator	1850	Apr. 16
San Miguel, Antonio, Cuban railroad official	1852	Aug. 9
Santa Cruz, Marquis of, Spanish grandee	1875	Sept. 13
*Sargent, Fred Wesley, U.S. railroad executive, retired	May 26, 1876	Feb. 4
Sargent, William Durham, U.S. engineer	June 16, 1863	Feb. 15
*Savage, Michael Joseph, prime minister of New Zealand	Mar. 7, 1872	Mar. 26
*Schereschewsky, Dr. Joseph Williams, U.S. cancer expert	Mar. 6, 1873	July 9
Schilder, Dr. Paul Ferdinand, U.S. psychiatrist	Feb. 15, 1886	Dec. 8
Schleicher, John C., U.S. piano manufacturer	June 3, 1861	July 28
Schnoeller, Dr. Anton, Swiss tuberculosis specialist	1865	Nov. 3
Schoenfeld, Berman, Sr., U.S. merchant	1871	Oct. 15
Schoff, Mrs. Hannah Kent, U.S. philanthropist	1853	Dec. 10
Schoonmaker, Edwin Davies, U.S. author and lecturer	Feb. 1, 1873	May 4
Shoup, Oliver Henry, ex-governor of Colorado	Dec. 13, 1869	Sept. 30
Schratt, Katharina (Mme. Geza von Kiss Ittebe), Austrian actress	1853	Apr. 17
Schroder, Baron Bruno, British international banker	Mar. 14, 1867	Dec. 10
Scott, Bertrand W., U.S. winner of first transcontinental automobile race	1883	Jan. 15
Scriven, George Percival, U.S. brigadier general, retired	Feb. 21, 1854	Mar. 7
*Scudder, Janet, U.S. sculptor and painter	Oct. 27, 1873	June 9
Seaman, Henry Bowman, U.S. engineer	Jan. 20, 1861	Oct. 24
Sears, Dr. George Gray, U.S. physician	Oct. 22, 1859	May 27
Seger, Charles Bronson, U.S. business executive	Aug. 29, 1867	Nov. 11
Seger, George N., U.S. congressman	Jan. 4, 1866	Aug. 26
Selby, Norman (Kid McCoy), U.S. pugilist	Oct. 17, 1873	Apr. 18
Seligman, Charles Gabriel, English anthropologist	1873	Sept. 19
Seligmann, René, Franco-U.S. art dealer	1893(?)	July 21
Sevier, Henry Hulme, U.S. diplomat	Mar. 16, 1878	Mar. 10
Seymour, George Francis Alexander, 7th Marquess of Hertford	Oct. 20, 1871	Feb. 16
Shambaugh, Benjamin Franklin, U.S. educator	Jan. 29, 1871	Apr. 7
*Shanks, David Carey, U.S. soldier	Apr. 6, 1861	Apr. 10
Shapiro, David, U.S. publisher	1872	Nov. 2
Shaw, Harlan P., U.S. educator	1866	Jan. 16
Sherwood, Sir Percy, Canadian police official	1854	Oct. 15
Shiels, Albert, U.S. professor	July 9, 1865	Mar. 14
Shinn, Mrs. Florence Scovel, U.S. illustrator	(?)	Oct. 17
Shinn, Millicent Washburn, U.S. child psychologist	1858	Aug. 14
Shumway, Daniel Bussier, U.S. professor	1868	Jan. 11
Sidebotham, Herbert, British journalist	Dec. 21, 1872	Mar. 19
Siemiradzki, Thomas, Polish-U.S. journalist	1859	Mar. 26
Silzer, George S., ex-governor of New Jersey	Apr. 14, 1870	Oct. 16
Simeone, Rev. Augustin Joseph Marie, French Catholic bishop	1863	Oct. 24
*Simmons, Furnifold McLendell, U.S. attorney and legislator	Jan. 20, 1854	Apr. 30
Simpson, Helen De Guerry, British novelist	Dec. 1, 1897	Oct. 15
*Singer, Dr. Harold Douglas, U.S. alienist	Jan. 7, 1875	Aug. 29
Skobline, Nadine, Russian concert singer	1886	Oct. 1
Slater, Sir (Alexander) Ransford, British colonial official	Nov. 28, 1874	Apr. 23
Sledd, Benjamin F., U.S. professor and author	1864	Jan. 4
Sloane, Thomas O'Connor, U.S. novelist and scientist	Nov. 24, 1851	Aug. 7
Smillie, Robert, British labour leader	Mar. 17, 1857	Feb. 16
Smith, Clarence James, U.S. publisher	July 29, 1874	Aug. 28
Smith, Clyde Harold, U.S. congressman	June 9, 1876	Apr. 8
Smith, Frederick Arthur, U.S. journalist	July 22, 1875	Oct. 26
Smith, George Theodore, U.S. industrialist	Apr. 29, 1855	Dec. 19
Smith, Homer Amos Arthur, head of the Washington, D.C., office of the Panama canal	Mar. 4, 1875	Mar. 20
Smith, Roy Campbell, U.S. naval officer	July 16, 1858	Apr. 10
Smith, Walter Tenney, U.S. real estate authority	Aug. 2, 1870	Nov. 11
Smith, Wilbur Fisk, U.S. educator	May 21, 1856	Aug. 9
Smithers, Ernest Leonard, U.S. railroad official	Nov. 18, 1867	June 4
Snider, Guy Edward, U.S. economist	1876	Jan. 10
South, Dr. John Glover, ex-U.S. diplomat	Jan. 23, 1873	May 13
Sparre, Christian, Norwegian vice admiral	1859	Dec. 3
Spaulding, Edward Gleason, U.S. professor	Aug. 6, 1873	Jan. 31
Spencer, Dr. Walter George, English surgeon	1857	Oct. 29
Spiller, Dr. William Gibson, U.S. neurologist	Sept. 13, 1863	Mar. 18
Spottswood, James, U.S. actor	1882	Oct. 11
Spring-Rice, Dominick, British financier	1889	Nov. 13
*Squires, Sir Richard Anderson, ex-prime minister of Newfoundland	Jan. 18, 1880	Mar. 26
Stacey, Alfred Edwin, past commander of the G.A.R.	Jan. 20, 1846	Mar. 10
Staley, Augustus Eugene, U.S. manufacturer	Feb. 25, 1867	Dec. 26
Stanley, Freelan O., U.S. inventor	June 1, 1849	Oct. 2
Staples, Arthur Gray, U.S. journalist	July 4, 1861	Apr. 2
Starr, Ellen Gates, U.S. co-founder of Hull House with Jane Addams	Mar. 19, 1859	Feb. 10
Steere, Joseph Beal, U.S. zoologist	Feb. 9, 1842	Dec. 7
Stekel, Wilhelm, Austrian psychoanalyst	(?)	June 27
Stephens, George Ware, U.S. educator	Sept. 18, 1878	May 13
Stephens, Ward, U.S. composer	Sept 9, 1879	Sept. 11
Stephenson, Orlistus Bell, U.S. lyceum manager	Oct. 18, 1867	July 24
Steuer, Max David, U.S. lawyer	Sept. 6, 1871	Aug. 21
Stevens, Alviso Burdett, U.S. professor	June 15, 1853	Jan. 25
Stevens, James Stacy, U.S. educator	Aug. 21, 1864	Mar. 24

Name	Birth date	Death date
*Stewart, Rev. George Craig, U.S. Protestant Episcopal bishop	Aug. 18, 1879	May [illegible]
Stewart, James Rowe, U.S. advertising agent	Nov. 5, 1876	May [illegible]
Stockbridge, Frank Parker, U.S. editor and author	June 11, 1870	Dec. [illegible]
Stockton, Philip, U.S. financier	Mar. 20, 1874	Feb. [illegible]
Stoddard, Frederick Lincoln, U.S. artist	Mar. 7, 1861	Feb. [illegible]
Stone, Allison, U.S. newspaper publisher	July 17, 1873	Sept. [illegible]
Storey, William Benson, U.S. railroad president	Nov. 17, 1857	Oct. [illegible]
Strickland, Baron Gerald, British colonial governor	May 24, 1861	Aug. [illegible]
Strong, Charles Augustus, U.S. psychologist	Nov. 28, 1862	Jan. [illegible]
Sturani, Giuseppe, Italo-U.S. musician	Nov. 15, 1877	Jan. [illegible]
Sturges, Dwight Case, U.S. artist	Oct. 21, 1874	Sept. [illegible]
Sung Cheh-Yuan, Chinese war lord	1885	Apr. [illegible]
Suzuki, Kisaburo, Japanese statesman	1867	June [illegible]
Sweeny, Rev. James Fielding, Canadian bishop	1857	Sept. [illegible]
Swift, Oscar William, ex-U.S. congressman	Apr. 11, 1869	June [illegible]
Swisher, Charles Clinton, U.S. professor	1846	Feb. [illegible]
*Tainter, Charles Sumner, U.S. inventor	Apr. 25, 1854	Apr. [illegible]
Tait, Sir Thomas, Canadian railway official	July 24, 1864	July [illegible]
Tanner, John Henry, U.S. professor	Mar. 1, 1861	Mar. [illegible]
*Taussig, Frank William, U.S. economist	Dec. 28, 1859	Nov. [illegible]
*Taylor, David Watson, U.S. naval officer	Mar. 4, 1864	July [illegible]
Taylor, Dr. Lewis Harvie, U.S. surgeon	July 26, 1875	Mar. [illegible]
Temperley, Maj. Gen. Arthur Cecil, British soldier	Aug. 31, 1877	Apr. [illegible]
*Tetrazzini, Luisa, Italian singer	June 29, 1871	Apr. [illegible]
*Thayer, Ernest Lawrence, U.S. journalist	Aug. 14, 1863	Aug. [illegible]
Thobe, Daniela, granddaughter of Franz Liszt	1860(?)	July [illegible]
Thomas, Sir Daniel Lleufer, Welsh lawyer	Aug. 29, 1863	Aug. [illegible]
Thomas, James Augustus, U.S. tobacco merchant	Mar. 6, 1862	Sept. [illegible]
Thompson, Holland, U.S. educator	July 30, 1873	Oct. [illegible]
Thompson, John Taliaferro, U.S. soldier	Dec. 31, 1860	June [illegible]
Thompson, Dr. William Eberle, U.S. physician	July 6, 1835	Feb. [illegible]
*Thomson, Sir Joseph John, British physicist	Dec. 18, 1856	Aug. [illegible]
Tighe, Michael F., U.S. labour leader	1858	Aug. [illegible]
Tihen, John Henry, U.S. Catholic bishop of Denver	July 14, 1861	Jan. [illegible]
Timken, Henry H., Sr., U.S. industrialist	Apr. 19, 1868	Oct. [illegible]
Tinney, Frank, U.S. comedian	Mar. 29, 1878	Nov. [illegible]
*Tokugawa, Prince Iyesato, Japanese statesman	July 11, 1863	June [illegible]
Torchiana, Henry Albert van Coenen, Dutch-U.S. author	Dec. 25, 1867	Mar. [illegible]
*Tovey, Sir Donald Francis, British composer	July 17, 1875	July [illegible]
Townsend, Arthur Farragut, U.S. rubber manufacturer	1865	Jan. [illegible]
Townshend, Dr. Raynham, U.S. physician	July 10, 1878	Jan [illegible]
Trancuiashi, Grigore, Rumanian economist	1872	Jan. [illegible]
*Trotha, Adolf Lebrecht von, German vice admiral	Mar. 1, 1868	Oct. [illegible]
*Trotsky, Lev Davidovich, Russian politician	1879	Aug. [illegible]
Trotter, Frank Butler, U.S. professor	Feb. 27, 1863	Mar. [illegible]
True, Rodney Howard, U.S. botanist	Oct. 14, 1866	Apr. [illegible]
Tryon, George Clement, 1st Baron, British statesman	May 15, 1871	Nov. [illegible]
Tsai Yuan-Pei, Chinese educator	1867	Mar. [illegible]
*Turpin, Ben, U.S. comedian	1869	July [illegible]
Tweed, Thomas Frederic, British politician	1890	Apr. [illegible]
Tweedie, Mrs. Alec, British author	(?)	Apr. [illegible]
*Tweedsmuir, 1st Baron (John Buchan) governor general of Canada	Aug. 26, 1875	Feb. [illegible]
*Ulmanis, Karl, Latvian statesman	Sept. 4, 1877	July [illegible]
*Untermyer, Samuel, U.S. lawyer	Mar. 2, 1858	Mar. [illegible]
*Unwin, Sir Raymond, British town planner	Nov. 2, 1863	June [illegible]
Vance, William Reynolds, U.S. professor	May 9, 1870	Oct. [illegible]
Vanderbilt, Anne Harriman (Mrs. William K.), U.S. philanthropist	1864	Apr. [illegible]
Vann, Robert L., U.S. Negro publisher	1879	Oct. [illegible]
Variell, Dr. Arthur Davis, U.S. physician	Aug. 26, 1868	Apr. [illegible]
Varrell, Harry Maxwell, U.S. educator	July 14, 1878	May [illegible]
Vassallo, Ernesto, Italian senator	1875	May [illegible]
Vauclain, Samuel Matthews, U.S. locomotive builder	May 18, 1856	Feb. [illegible]
Vaughan, John Albert, U.S. sea captain	Sept. 11, 1840	June [illegible]
Vaughn, Edmund Gustave, U.S. philanthropist	Jan. 14, 1867	Apr. [illegible]
*Verdier, Jean, French cardinal	Feb. 1864	Apr. [illegible]
Vestey, William, 1st Baron, British industrialist	Jan. 21, 1859	Dec. [illegible]
Vickery, Dr. Herman Frank, U.S. physician	Aug. 20, 1856	Feb [illegible]
Vivian, George Crespigny Brabazon, 4th Baron, British soldier	Jan. 21, 1878	Dec. [illegible]
Volpe, Arnold, U.S. conductor	July 9, 1869	Feb. [illegible]
Von Poswik, Dr. Gisela, U.S. radiologist	June 19, 1875	Oct. [illegible]
*Vuillard, Jean Edouard, French artist	1868	June [illegible]
Wadhams, Dr. Robert Pelton, U.S. surgeon	Jan. 10, 1879	Dec. [illegible]
*Wagner-Juaregg, Julius, Austrian physician	Mar. 7, 1857	Oct. [illegible]
Wakeman, Samuel Wiley, U.S. ship builder	Nov. 15, 1876	May [illegible]
*Wald, Lillian D., U.S. sociologist	Mar. 10, 1867	Sept. [illegible]
Wales, George Canning, U.S. etcher and lithographer	Dec. 23, 1868	Mar. [illegible]
Walker, John Yates Gholson, U.S. broker	Apr. 11, 1871	Feb. [illegible]
Wambaugh, Eugene, U.S. lawyer	Feb. 29, 1856	Aug. [illegible]
Wantanabe, Viscount Chifuyu, Japanese statesman	1877	Apr. [illegible]
Ward, George S., U.S. industrialist	1867	Sept. [illegible]
Waring, Samuel James, Baron, British industrialist	Apr. 19, 1860	Jan. [illegible]
Warren, George Copp, U.S. highway engineer	Sept. 1, 1863	July [illegible]
Warrington, George Howard, U.S. lawyer	Oct. 21, 1872	Nov. [illegible]
Warvelle, George William, U.S. lawyer	May 3, 1852	Nov. [illegible]
Washington, Basil George, British rear admiral	(?)	Sept. [illegible]
Waste, William Harrison, chief justice of California	Oct. 31, 1868	June [illegible]
Watrous, George Dutton, U.S. lawyer	Sept. 18, 1858	Nov. [illegible]
*Watrous, Harry Willson, U.S. artist	Sept. 17, 1857	May [illegible]
Watson, Clarence Wayland, ex-U.S. senator	May 8, 1861	May [illegible]
Watson, Frank Rushmore, U.S. architect	Feb. 28, 1859	Oct. [illegible]
*Waugh, Frederick Judd, U.S. artist	Sept. 13, 1861	Sept. [illegible]
Weaver, Frederick Pattison, U.S. educator	Nov. 7, 1882	Sept. [illegible]
Webb, Sir Henry, British industrialist	July 28, 1866	Oct. [illegible]
Weed, Charles Frederic, U.S. banker	Oct. 22, 1874	May [illegible]
Weeks, Dr. Webb William, U.S. ophthalmologist	1885	Jan. [illegible]
Weicker, Theodore, U.S. industrialist	June 6, 1861	Aug. [illegible]
Wells, William J., U.S. merchant	Dec. 15, 1878	Mar. [illegible]
Wenckebach, Dr. Karel Friedrik, Austrian heart specialist	1864	Nov. [illegible]
Wenninger, Francis Joseph, professor Notre Dame	Oct. 27, 1888	Feb. [illegible]
West, Henry Litchfield, U.S. journalist	Aug. 20, 1859	Sept. [illegible]
Wetmore, James Alphonso, U.S. architect	Nov. 10, 1863	Mar. [illegible]
Wheeler, Alvin Sawyer, U.S. educator	Nov. 2, 1866	May [illegible]
Whitcher, Frank Weston, U.S. industrialist	Nov. 10, 1855	Feb. [illegible]
White, Frank, ex-U.S. treasurer	Dec. 12, 1856	Mar. [illegible]
White, Harry, U.S. politician	Jan. 5, 1860	Feb. [illegible]
White, Matthew, Jr., U.S. editor	Sept. 21, 1857	Sept. [illegible]

Name	Birth Date	Death Date
HITTINGHAM, WILLIAM, British rear admiral	1862	Sept. 30
LD, HORACE B., U.S. airman	1879(?)	July 23
LGUS, SIDNEY DEAN, U.S. psychiatrist	Feb. 16, 1872	Feb. 22
LKE, HUBERT, U.S. opera singer	1855	Oct. 22
LKINS, THOMAS RUSSELL, U.S. physicist	June 6, 1891	Dec. 10
LKINSON, SIR NEVILE RODWELL, Anglo-Irish soldier	Oct. 26, 1869	Dec. 22
LLCOX, WILLIAM RUSSELL, U.S. lawyer	Apr. 11, 1863	Apr. 9
LLIAMS, REV. GEORGE PHILIP, U.S. missionary	May 13, 1859	Apr. 7
LLIAMS, HENRY HORACE, U.S. educator	Aug. 16, 1858	Dec. 26
LLIAMS, REV. JOSEPH JOHN, U.S. anthropologist	Dec. 1, 1875	Oct. 28
LLIAMS, NEWTON S., U.S. railroad official	May 29, 1878	Sept. 17
LLIAMS, RALPH E., U.S. politician	1870	May 16
LLIAMS, THOMAS SUTLER, U.S. judge	Feb. 14, 1872	Apr. 5
LLIAMS, DR. WILLIAM ROBERT, U.S. physician	June 13, 1867	Nov. 17
LLS, C. HAROLD, U.S. engineer	1878	Dec. 30
LSON, ALFRED FREDERICK, U.S. journalist	Aug. 28, 1883	June 25
LSON, SIR GUY DOUGLAS ARTHUR FLEETWOOD, British civil servant	Oct. 21, 1850	Dec. 28
LSON, HERBERT WRIGLEY, British author	Oct. 25, 1866	July 12
LSON, JOHN MCCALMONT, U.S. industrialist	Mar. 17, 1876	Sept. 5
LSON, JOSEPH MARCELIN, Canadian senator	Dec. 26, 1859	Sept. 10
NSLOW, SAMUEL ELLSWORTH, U.S. industrialist	Apr. 11, 1862	July 11
NSOR, FREDERICK, U.S. educator	Mar. 29, 1872	Nov. 26
NTHROP, BEEKMAN, ex-Gov. of Puerto Rico	Sept. 18, 1874	Nov. 10
SE, FREDERIC MAY, U.S. soldier	Oct. 6, 1877	July 24
LFE, HUMBERT, British poet	Jan. 5, 1885	Jan. 5
LFF, ADA, U.S. feminist	1880	Oct. 19
LFF, JOHN ELIOT, U.S. geologist	Nov. 21, 1857	Aug. 9
LFF, OTTO, German industrialist	1880	Jan. 22
OD, EDWIN ELLSWORTH, U.S. educator	Sept. 8, 1863	Jan. 23
OD, SPENCER SHEPARD, U.S. naval officer	Aug. 7, 1861	July 30
OD, WASHINGTON FERNANDO, U.S. industrialist	1870	Aug. 5
OODBRIDGE, FREDERICK JAMES EUGENE, U.S. educator	Mar. 26, 1867	June 1
OODBURY, CHARLES HERBERT, U.S. artist	July 14, 1864	Jan. 21
OODCOCK, REV. CHARLES EDWARD, U.S. Episcopal bishop	June 12, 1854	Mar. 12
ORCESTER, REV. ELWOOD, U.S. clergyman	1862	July 19
ORDEN, EDWARD CHAUNCEY, U.S. chemist	Apr. 17, 1875	Sept. 22
EN, FRANK GEORGE, U.S. educator	Mar. 15, 1874	July 17
IGHT, SIR HERBERT, British industrialist	Sept. 10, 1874	Oct. 28
LLIE, REV. DWIGHT WITHERSPOON, U.S. clergyman	July 16, 1876	Dec. 30
MAN, WALTER FORESTUS, U.S. business executive	Dec. 21, 1881	Nov. 21
MAYA, TANIN, Japanese admiral	(?)	Sept. 10
NCEY, LEWIS ALONZO, U.S. aviator	Sept. 16, 1895	Mar. 2
LLIN, SAMUEL, U.S. metal worker	Mar. 2, 1885	Oct. 3
DER, ALBERT HENRY, U.S. educator	Feb. 16, 1866	Sept. 22
ST, ALBERT H., U.S. insurance official	Jan. 30, 1877	July 23
UNG, C. JAC, U.S. etcher	Dec. 21, 1880	Mar. 4
UNG, GEORGE BRIGHAM, U.S. insurance executive	Apr. 20, 1867	Apr. 10
ASA, KURAHEI, Japanese statesman	1874	Dec. 24
IMERMANN, ARTHUR, German diplomat	May 8, 1859	June 6
SSER, DR. HANS, U.S. bacteriologist	Nov. 17, 1878	Sept. 4

stetrics: *see* GYNAECOLOGY AND OBSTETRICS.

ean Liners: *see* SHIPBUILDING.

eanography. Because of the international situation, little oceanographic research was published in opean countries during 1940 and the field work was almost irely limited to waters close to the United States.

cean Currents.—The further development of the bathythermograph and tiple sea sampler provided reliable tools for a new approach to several ortant aspects of the circulation problem in the sea. These instruments capable of disclosing the detailed distribution of temperature and ity in the surface layer (down to 150 m.) and can be used from a el steaming at 10 knots or more. At such speeds physical oceanography at last be studied more or less from the synoptic standpoint.

he importance of lateral mixing in determining the physical character-s of the deeper waters was further emphasized. A study of the mixing he South Atlantic of water of antarctic origin with deep water from the th Atlantic pointed to a very high coefficient of lateral mixing. It is clear from this analysis that along the convergence, separating these primary water masses, ascending flow of the mixed water may reach siderable proportions.

lankton.—Dispersal of the pelagic larval stages of animals inhabiting stal waters received further study, both off the California coast and in Georges banks area off New England. These investigations pointed to urely physical cause for the great variability from year to year in the itions to the adult populations of many of the commercial fish. In this k a new plankton sampler, which is quantitatively reliable, proved most ful.

ubmarine Geology.—The precipitation of calcium carbonate in shallow as such as the Great Bahama bank has long been a controversial prob-. Recent studies give no support to the theory that bacteria are the ncy, but suggest that the main deposition is effected by purely physico-nical processes.

simple and inexpensive submarine camera was developed to photograph bottom in any depth. The pictures thus far secured are remarkably r and cover an area of about 6 sq.ft. By including a compass and a ent indicator in the field of the camera the action of currents on the om sediments can be studied. It has been found, for example, that in ths as great as 150 fathoms the sand ripples reorient themselves to stage of the tidal flow. (*See* also FISHERIES; MARINE BIOLOGY; LOGY.)

BIBLIOGRAPHY.—"Lateral Mixing in the Deep Water of the South At-tic," *Jour. of Marine Research*, vol. ii, no. 3 (1939); "The Correlation Water Movements and Dispersal of Pelagic Littoral Animals, Especially the Sand Crab, Emerita," *Ibid.*, vol. ii, no. 3 (1939): "A Detailed Study of the Surface Layers of the Ocean in the Neighborhood of the Gulf Stream with the Aid of Rapid Measuring Hydrographic Instruments," *Ibid.*, vol. iii, no. 1 (1940); "Instrument for Quantitative Plankton Investigations," Limnological Society of America, Special Publications no. 5 (1940); "The Great Bahama Bank. II. Calcium Carbonate Precipitation," *Jour. of Marine Research*, vol. iii, no. 2 (1940). (C. O'D. I.)

O. Henry Memorial Awards: *see* LITERARY PRIZES: *United States.*

Ohio, north central state of the United States, popularly known as the "Buckeye state"; area, 41,040 sq.mi.; population (1940 census), 6,907,612. Capital, Columbus, with a population of 306,087 (1940). Other cities of over 100,000 were: Cleveland, 878,336; Cincinnati, 455,610; Toledo, 282,349; Akron, 244,791; Dayton, 210,718; Youngstown, 167,720; and Canton, 108,401.

History.—While President Roosevelt won Ohio's electoral votes in the Nov. 1940 election by polling 1,773,139 ballots, to 1,586,-773 for Wendell Willkie, Republicans won a majority of the state offices. Governor John W. Bricker, Republican of Columbus, was re-elected, defeating former Governor Martin L. Davey, Democrat of Kent, 1,818,335 to 1,455,284. Mayor Harold H. Burton (Rep.) of Cleveland was elected to the United States senate, receiving 1,598,560 votes to the 1,454,012 that went to former Congressman-at-large John McSweeney (Dem.) of Wooster. Others elected to principal offices were: Paul M. Herbert (Rep.), lieutenant governor; John E. Sweeney (Dem.), secretary of state; Thomas J. Herbert (Rep.), attorney-general; Don H. Ebright (Rep.) treasurer; and Joseph T. Ferguson (Dem.) auditor. George H. Bender (Rep.) and Stephen M. Young (Dem.), both of Cleveland, were elected congressmen-at-large. Elected to the Ohio supreme court were: Charles B. Zimmerman, Edward C. Turner and Gilbert Bettman.

Republicans retained control of both houses of the state legislature but only by narrow margins. Ohio Democrats gained four house seats in congress to achieve equal representation with the Republicans, each having 12.

Census figures in 1940 showed that Ohio had a population increase of 3·9% and still was the fourth largest state but would lose a seat in congress because its gain was proportionately less than that of other states.

Three important actions were taken by the Ohio legislature in June. It voted to separate the presidential and state ballots, a Republican stratagem designed to protect Republican candidates for state and county offices from being overwhelmed by straight-ticket voters in the event of a national Democratic landslide. It increased maximum old age pensions from $30 a month to $40 effective Jan. 1, 1941 and appropriated an additional $1,000,000 to provide for applicants for pensions who were then on the waiting list. The third important action was the appropriation of $1,400,000 for poor relief. This, combined with improved business conditions and an Ohio supreme court ruling of July 17 which validated the law authorizing taxing units to issue bonds against delinquent taxes for poor relief, ended all fear of a repetition of the 1939 relief crises in the state. By Nov. 23 Ohio's poor relief load was down to 76,200, the lowest in three years.

The state bureau of unemployment compensation reported the placement of 158,010 persons in private industry during the first 11 months of 1940. This was an increase of 41,511 or more than 35% over the corresponding period of 1939. Part of this increase was directly attributable to the national defence program. Construction was well under way in December of one of the nation's most important arsenals on a site near Ravenna. The navy department announced that a naval ordnance plant would be erected at Canton on a site of more than 100 acres. It will cost $16,000,-000 and will employ 2,000 skilled workers. Another December an-

nouncement of the federal government was that an $11,000,000 TNT plant would be constructed three miles south of Sandusky. Many established factories in Ohio expanded to take care of mounting orders. One of the largest of these expansions was that of the Industrial Rayon corporation which is building a $4,000,000 addition to its plant near Painesville to increase production 50%. Steel tonnage output in the Youngstown district broke all records as the mills in December climbed to 97% of theoretical capacity.

Steel production in the Cleveland-Lorain district went to 93% in December.

Education.—Howard Landis Bevis, former Ohio supreme court judge, was appointed the seventh president of Ohio State university Jan. 8, 1940 and took up his duties at the fifth largest university in the nation on Feb. 1.

Agriculture, Manufactures, Mineral Production.—Important crops with figures of production for 1940 are as follows: corn, 120,750,000 bu.; wheat, 42,137,000 bu.; oats, 44,880,000 bu.; barley, 1,650,000 bu.; tame hay, 4,241,000 tons; tobacco, 26,430,000 lb.; potatoes, 11,800,000 bu.; soybeans, 8,400,000 bu.; sugar beets, 361,000 tons; apples, 5,074,000 bu.; grapes, 38,000 tons. Manufactures in 1937 were valued at $5,099,816,893 or 8.4% of the national total, with steel products, rubber tires, electrical machinery and motor vehicles leading. Total mineral output in 1938 was valued at $103,620,000. Principal minerals were coal, coke, clay products, natural gas, stone, lime and pig iron.

(P. By.)

Ohio State University. Formally established as a land grant institution in 1870, the Ohio State university opened its doors on Sept. 17, 1873 to a student body of 17. In the autumn quarter of 1940 the full-time, resident enrolment reached a figure of 13,016. The annual enrolment, including summer quarter, is 18,003. Centrally located in Columbus, the capital city of Ohio, the university draws its student body from all 88 counties, as well as from other states and nations.

It has a teaching staff of 1,339.

Dr. Howard Landis Bevis took office Feb. 1, 1940 as the university's seventh president, succeeding Dr. George Washington Rightmire who had been made president emeritus. The formal inauguration Oct. 25 brought 300 official delegates from colleges, universities and learned societies. During 1940 a new men's dormitory housing 550 men was completed, and additional facilities for women were provided. The research program was expanded through gifts to the new development fund, most notable being the installation of a new cyclotron and an electron microscope.

Oil: *see* Petroleum.

Oils and Fats, Vegetable and Animal: *see* Vegetable Oils and Animal Fats.

Oklahoma, a west south central state and the forty-sixth of the United States, has a total area of 70,057 sq.mi. The people of the state are popularly known as "Sooners," from the name applied to those who crossed the starting line sooner than the official time established by the government for the first land run into Oklahoma, April 22, 1889. The population in 1940 was 2,336,434, a decrease, largely in rural population, of 59,606 from 1930 to 1940. The largest loss was in that part of Oklahoma which lies in the area commonly called the "Dust Bowl." Due to the decrease, the additional representative given to the state in 1931 will probably be taken away in the new congressional apportionment. The two largest cities were Oklahoma City, population 204,424, and Tulsa, population 142,157, both of wh showed increases in the past decade.

History.—As 1940 ended, the chief interest in Oklahoma national defence. Plans were being completed for a bomb squadron base for Oklahoma City and an aeroplane assem plant for Tulsa. In September, the Oklahoma national guard part of the 45th division, was inducted into the army of United States and was (1941) in training at Fort Sill. In Octob 300,000 men registered for the draft and a quota of 9,365 m was set for training in 1941. In an attempt to thwart a possible "fifth column" activities, several members of the Co munist party were indicted by the Oklahoma county grand jury charges of criminal syndicalism under a law passed during World War of 1914–18.

By the end of 1940, two of the accused had been convic and sentenced to ten years in the state prison at McAlester. Ot cases were pending.

Politically, 1940 was comparatively quiet as far as st politics were concerned. The term of neither senator expired w the 76th congress, and no important state office was to be fill In the presidential race, President Roosevelt easily won the sta 11 electoral votes with a vote of 474,313 compared to 348,8 for Mr. Willkie. With the exception of the 8th district, all cumbent Democrats were returned to the house of representati by large majorities.

Perhaps the outstanding event of 1940 was the contest tween the federal government and Governor Leon C. Phill over the flood-control projects in the state. For several yea the United States had been building a dam on the Grand river northeastern Oklahoma. In March, the Grand River Dam auth ity ordered the flood gates to be closed, thus flooding acres farm land and state highways. Governor Phillips did not feel t the state had been reimbursed properly for the lost highways a attempted to halt the flooding until proper settlement had b made. Nevertheless, the gates were ordered closed but before t could be done, the governor called out the national gu and placed the area under martial law. However, a fede court order was issued restraining the governor and the ga were closed before a settlement agreeable to the state reached.

Banking and Finance.—Of the 77 counties, 69 are in the 1 (Kansas City) federal reserve district and eight in the 1 (Dallas) district. In June, there were 182 state banks w capital amounting to $8,154,567 and total deposits amou ing to $55,834,005 and 209 national banks with capital st of $24,301,000 and deposits of $402,903,000. The funded st debt stood at $25,343,681, plus outstanding warrants equal $6,692,197.

Agriculture, Manufactures, Mineral Production.—The ch agricultural commodities are wheat, cotton, corn, grain sorghu and broom corn. The year 1940 was a good agricultural year w steady increases of yield in all crops except wheat. The p duction of cotton was 805,000 bales as compared to 526,000 1939. Wheat production was 56,332,000 bu. compared to 60,4 000 in 1939 and corn production was 40,356,000 compa to 27,216,000 bu. The principal mineral products are petrole coal, lead and zinc, gypsum and asphalt. There were about 1 530,000 bbl. of crude oil produced, 1,340,329 tons of coal, 185, tons of lead and zinc, 96,815 tons of gypsum and 106,539 tons asphalt. This was an increase in all mineral products except g sum. The chief manufactures were glass, cement, flour, broo bricks, pottery and refinery products.

(R. Git.)

Old Age Pension: *see* Relief; Social Security; Uni States: *Social Security*. *See* also under various states.

ve Oil: *see* VEGETABLE OILS AND ANIMAL FATS.

ian and Muscat: *see* ARABIA.

tario, one of the original provinces of the dominion of Canada; area, 412,582 sq.mi.; population according he dominion census of 1931, 3,431,683, estimated Jan. 1, 1, 3,752,000. Capital, Toronto, 631,207. Of the province's ulation 2,095,992 are urban, or 61%; 2,794,631 native born .1%.

Iuch attention has been directed to the policy of the govern- t of Ontario in supplying cheap light and power to the people the province through the publicly owned and controlled lro-Electric Power commission. The commission provides tric services to 821 municipalities, comprising nearly all of cities and towns in the province as well as many small com- nities and local areas. The actual distribution within a munici- ty is performed by the municipality itself, under the supervi- of the commission. The capital of the commission and nicipal utilities amounts to $436,822,000, reserves $200,103,- Rates are low and the service is excellent. The net value ne total production of the province in 1937 was $1,158,885,508, ight decrease from the preceding year.

he net annual agricultural revenue in 1937 was $225,368,910; nineral products for 1937, $151,874,462. The net value of st products was $61,056,240; of manufactured products 1,429,858.

he provincial election of 1937 resulted in the return to power he Liberal party under the leadership of the Hon. Mitchell burn. The party standing of the provincial legislature com- es 63 Liberals, 23 Conservatives and 4 Independents. The tenant-governor is the Hon. Albert Matthews. Ontario is resented in the dominion parliament by 24 senators, appointed life and 82 members of the house of commons elected for rm of five years or less.

BIBLIOGRAPHY: *Annual Report of the Department of Labour; Statis- Year Book of Ontario; Annual Report of the Hydro-Electric mission.* (J. C. HE.)

era: *see* MUSIC.

ium: *see* DRUGS AND DRUG TRAFFIC: *League of Nations.*

anges. The largest crop of oranges ever produced in the United States was grown in 1940. The department agriculture estimated production Dec. 1, 1940[1], as 81,887,000 es compared to 75,646,000 in 1939 and 56,125,000 boxes for ten-year (1929–38) average. The previous record crop was in 8–39 when 78,531,000 boxes were produced.

Orange Production by States, 1940, 1939 and 10-Year Average

	1940 Boxes*	1939 Boxes*	1929–38 Boxes*
lifornia			
Valencias	28,782,000	26,883,000	19,830,000
Navels and miscellaneous	19,505,000	17,521,000	15,127,000
orida			
Early and mid-season	16,000,000	15,600,000	12,125,000
Valencias	11,000,000	10,000,000	8,108,000
Tangerines	2,800,000	2,400,000	3,400,000
Satsumas	.....	.....	.....
xas	2,975,000	2,360,000	947,000
izona	600,000	520,000	430,000
abama	1,000	75,000	96,000
ississippi	.....†	59,000	85,000
uisiana	224,000	228,000	385,000

erage net content per box is 70 lb. in California and Arizona; in other states 90
† Failure reported.

Other production in 1940 included 2,679,000 boxes in Aus- lia, about 300,000 boxes less than in 1939. In Jamaica 1940 oduction was 425,000 boxes compared to 475,000 in 1939. The Union of South Africa established a subsidy April 19, 1940, of $477,000 for aid to growers of all types of oranges, and growers of other citrus fruits, to "assure the survival of the industry." Exports of oranges from the Union of South Africa April to Sept. 1940, was 2,304 boxes compared to 4,325 in the same period in 1939. Exports of oranges from Palestine during the 1939–40 season were 6,540,000 boxes compared to 13,055,000 in the preceding season. The government also arranged for financial assistance to orange growers. (S. O. R.)

[1] Estimate, made on Dec. 1, 1940, does not take into account loss of fruit from the 12 and 13 freeze in California.

Oregon. The middle of the three Pacific coast states of the United States, popularly known as the "Beaver state," has an area of 96,699 sq.mi.; population, April 1, 1940 (census), 1,089,684; Portland, 1940 (census), 305,394; Salem, the capital, 1940 (census), 30,908. Governor: Charles A. Sprague.

History.—In the presidential election Franklin D. Roosevelt received 258,415 votes as against Wendell Willkie's 219,555. A Republican state treasurer, Leslie M. Scott, was elected, as was a Republican attorney-general, I. H. Van Winkle, in fairly close races. Three new representatives were elected to congress: two Republicans, James W. Mott and Homer D. Angell, and one Democrat, Walter M. Pierce.

The year 1940 saw Oregon making progress industrially, due to attraction of new manufacturing plants by cheap power provided by the federal Bonneville power administration and private electric plants and to increased production demanded by the rearmament program. At the year's end, the state's chief industry, lumbering, was employing the greatest number of workers in its history. Established plants were operating night and day and many new, small sawmills were getting into operation. The plywood branch of the industry expanded greatly during the year.

Shipbuilding was assured for Portland for the first time since the World War of 1914–18 when Willamette Iron & Steel company received a $25,000,000 contract for construction of two navy mine layers. Parts for Boeing bombers were being made in the Iron Fireman plant. Expenditure of $10,000,000 on the Tongue Point naval base near Astoria seemed assured and a $9,000,000 to $12,000,000 ammunition dump was expected to be built near Hermiston. Portland was selected as the site for an army air corps pursuit base and another was ordered built at Pendleton.

The state highway commission opened a new highway, the Willamette, across the Cascade mountains between western and eastern Oregon. A relocated highway over the Siskiyou mountains between Oregon and California was dedicated.

Education.—A school census showed 264,743 children of school age, of whom 205,928, including 63,057 high school pupils, were enrolled. There were 8,104 teachers and school properties were valued at $62,719,297. The school debt stood at $13,371,251.65.

Finances.—The state continued to reduce its bonded debt, which on Jan. 1, 1941, stood at $35,141,285. Oregon cities reduced their debt by $7,195,736 to $47,479,174 in two years ending July 1, 1940. In the same time counties of the state reduced their indebtedness from $18,148,575 to $14,835,389.

Manufactures.—Latest figures list 2,107 manufacturing plants in the state, employing 65,982 persons and producing products of a value of $363,143,053. Of this amount lumber products accounted for $127,760,857; canned and dried fruits and vegetables, $24,212,542; flour and other grain mill products, $19,138,231; meat packing, $17,253,182; paper, $16,643,999. (P. H. P.)

Osteopathy. The American Osteopathic association, at its 1940 convention at St. Louis, adopted a resolution emphasizing the importance of the profession's "contributing and co-operating to the utmost of its facilities for the advancement and preservation of the health and safety of the

American people." To help bring this about a study was made to assist in appraising the profession and its institutions. A questionnaire was distributed to the approximately 10,000 osteopathic physicians in the United States, and by early December a total of 8,890 of these had been returned. From these it was possible to tabulate a great deal of detailed information (supplementing that already on file), covering race, marital status, citizenship, country of birth, professional education (including internship), licensure, hospital service, public health activities, type of practice, specialty certificates, membership in specialty organizations, activity and method of practice, military experience, etc. At the beginning of the fiscal year in June, 1940, it was reported that 431 osteopathic physicians were graduated during the calendar year, and that after making allowance for those deceased or retired, there were 299 more in practice than a year before. There were at that time 157 osteopathic hospitals, enough at the accepted level to care for the hospital needs of 675,500 persons. The democratic principle of government in the affairs of the association was emphasized by statistics published immediately after the convention showing that in the house of delegates, which is the legislative body of the association, the members of which are chosen by members of "divisional societies" in the various states, territories and provinces, there was representation at St. Louis from 41 states, the District of Columbia and Ontario, 96·5% of the total association membership being so represented. (R. G. Hu.)

Ottawa, the capital of the Dominion of Canada and the seat of the supreme court, is situated on the right bank of the Ottawa river near the mouth of the Rideau, both rivers having very beautiful falls. The city itself is divided into an upper and a lower town by the Rideau canal. The parliament buildings are situated on a series of high bluffs which overlook the river, in one direction toward the Chaudière falls and in the opposite direction toward the Rideau falls. The population of the city is 126,872; of the metropolitan district (including Hull) 175,988. The gross value of manufactured products in 1940 was $28,244,935. Its most important educational institution is the Université d'Ottawa.

Bibliography.—*Handbook of the City of Ottawa; The Canada Year Book.* (J. C. He.)

Outer Mongolia: *see* Mongolia.

Owens, Robert Bowie (1870–1940), U.S. electrical engineer, was born in Anne Arundel county, Md., Oct. 29, and was graduated from Columbia university in 1891. He was professor of electrical engineering at the University of Nebraska from 1891 to 1898 and then served in the same capacity at McGill university until 1909. He was then elected secretary of the Franklin institute in Philadelphia where, except during the World War of 1914–18, he served until 1924. He was noted for his discovery of the Alpha ray and for the invention of an electromagnetic system for guiding ships and aeroplanes. After leaving the Franklin institute he lived in retirement for five years, but in 1929 he accepted appointment as head of the Maryland Academy of Sciences. He resigned in 1931 because of ill health. He died at his birthplace near Annapolis on Nov. 1.

Oxford University. In spite of the war, academic activities continued throughout 1940. In Michaelmas term 1939 there were 2,761 men undergraduates in residence, which was 1,169 less than in the previous year, and about the normal number of 750 women. Before the end of Hilary term 572 men had gone out of residence, mainly to join the fighting services, but there were 270 further matriculations in Hilary and Trinity terms. In Michaelmas term 1940, 731 men and women matriculated and the new academic year began with ab 2,750 men and women undergraduates in residence.

Special courses were introduced in 1939 for undergradua likely to be called up for national service before completing th normal residence, the subjects covered being those of cent importance in each faculty. The candidates' choice of subje was limited in order to preserve the specialist character of Oxford honour schools.

In the academic year 1939–40, the number of research stude was 206 which was 88 less than in the previous year; 996 perso took the B.A. degree, 312 the M.A., and the total number of p sons taking all other degrees was 186. On account of the w most university scholarships and prizes were suspended, but c lege scholarships, with few exceptions, were awarded as usu Eighty-nine members of the teaching and research staff of t university and colleges entered the fighting services or underto other temporary work of national importance.

Bibliography.—*The Oxford University Handbook; The Oxford University Gazette* for Oct. 16, 1940 containing the Vice-Chancellor's Review the year; *Oxford* (the magazine of the Oxford society). (D. V.)

Oxygen Therapy: *see* Surgery.

Pacific Islands, British. Territories of the British E pire in the Pacific ocean, which certain statistics are given in the table. *See* Briti Empire for population, capital towns, status and governors.

History.—The European war, with its repercussions in t Dutch East Indies and on the Thailand-Indo China fronti coupled with doubts as to the intentions of Japan, did not ma for stable conditions but did not seriously retard progress. Eve island contributed generously to British war funds; each put its in a state of defence; and in Fiji, after a voluntary defence for had been formed, it was necessary to prohibit men going to N Zealand and Australia to join up and for the imperial governme to refuse an offer of an expeditionary force on the ground th Fijian man power would be more useful at home.

Fiji suffered from the decline in the tourist traffic, but go mining and the new pineapple industry became increasingly im portant and the promised use of Suva as a port of call for P American Airways augured well for future prosperity; lack markets for copra led to government consideration of new indu tries, including bacon-pigs for export, poultry and egg productio and the extension of dairying, and experiments were made in t use of coco-nut oil in the running of diesel engines. The found tion stone of the Anglican cathedral at Suva was laid by S Henry Luke, the erection of a hospital with medical school, et at Ba at a cost of £78,500 was approved and a new post office a telephone exchange opened at Lautoka. Public broadcasting news in Fijian, English and Hindi was introduced.

In the Gilbert and Ellice group the fight against filariasis, ya (which has almost disappeared) and other tropical diseases w maintained; and on Canton hotels, stores, etc., were erect for Pan American Airways.

In New Guinea work was continued on the construction of t road from Salamaua on the coast to Wau, and a report on a 20,0 sq.mi. exploratory patrol in the northeast highlands describ it as a country with a golden future, much of the land bei suited to European settlement. In March Papua lost, throu death, Sir Hubert Murray, its first governor, who had admin tered the colony for 34 years; he was a noted anthropologist, a the extinction of cannibalism and cessation of tribal warfare the country were due to his wise rule. In the New Hebride R. D. Blandy succeeded G. A. Joy as resident commissione

British Pacific Islands

Territory and Area Square Miles	Principal Products Exported	Imports and Exports (in thousand £)	Revenue and Expenditure (in thousand £)	Education: Elementary and Secondary 1937
7,055	(1939) (value) sugar £1,425,704 copra £204,289 gold bullion £928,128 bananas £26,411	(1939) imp. £ Fiji 1,625 exp. £ Fiji 2,746	(1937–38) rev. £ Fiji 890 exp. £ Fiji 967	(1938) schls., 253; schlrs. 29,323 (1,622 Eurpn., 19,580 Fiji, 7,968 Ind., 153 Chinese)
UA (administered by the Commonwealth of Australia; *see also* PACIFIC SLANDS, MANDATED) 87,786 (mainland) ,754 (islands)	(1938–39 export) rubber £114,949 gold £150,198 copra £57,999	(1939) imp. 514.8 exp. 490.2	(1938–39) rev. £A. 165.8 exp. £A. 166.7	Some mission schools with compulsory attendance for native children
BERT AND ELLICE ISLANDS COLONY (including the Gilbert group; the Ellice roup; Ocean island [seat of administration]; Fanning, Washington and Christmas islands; and the Phoenix group*). 200	(1938) phosphate of lime 329,800 tons copra 4,850 tons	(1937–38) imp. 207 exp. 351	(est. 1938–39) rev. 80.6 exp. 84.6	schls., 224; schlrs., 6,728
W HEBRIDES (a condominium administered jointly by the British and French overnments†) 5,700	(1938) copra 11,448 tons cocoa 1,893 tons	(1938) imp. 112 exp. 120	(1938) rev. 27.6 exp. 23.9	Numerous Presbyterian and Catholic mission native schls., 1 Fr. Govt. schl., and 1 Catholic mission schl. for whites
ITISH SOLOMON ISLANDS PROTECTORATE, 1,458	(1938) copra 22,937 tons	(1937–38) imp. 233 exp. 292	(est. 1938–39) rev. 69.5 exp. 69.3	elem. schls., 6; schlrs., 4,889
NGAN ISLANDS PROTECTORATE. *c.* 250	copra 10,500 tons (1939) bananas, 10,825 cases	(1938–39) imp. 79.7 exp. 79.8	(est. 1938–39) rev. 64.4 exp. 73.8	schls., 108; schlrs., 6,128

anton and Enderbury Islands, in the Phoenix group, are shared with the U.S.A. under the Anglo-American pact, Aug. 10, 1938.
ew Hebrides adhered to the Free French cause of General de Gaulle in 1940.

cific Islands, French. The latest available statistics for this French colony are given ewith: area (Society, Tuamotu, Tubai and Marquesas is.), 40 sq.mi.; pop. (est. Dec. 31, 1937) 45,000 (whites, *c.* 3,700). ef town: Papeete (in Tahiti), cap., 8,460. Governor M. nsard.

inance 1939: local budget (est.) 27,560,000 francs.

Overseas Trade 1938: imports 63,241,000 francs; exports 647,000 francs. Roads 1937: Tahiti 48 mi.; Raiaeta 19 mi.; ping (1938) cleared, 162,927 net tons.

roduction 1938: copra 25,000 francs; vanilla 12,000 francs; ural phosphates (1937) 147,000 metric tons.

cific Islands, Mandated. The former German possessions in the western Pacific nprise part of New Guinea with adjacent archipelagos, West- Samoa, the Marshall, Caroline, Palan and Ladrone, or Mari- ne islands, and the islet of Nauru. Statistics for these terri- ies are given in the following table. For capital towns and vernors of New Guinea, Western Samoa and Nauru, *see* ITISH EMPIRE.

Mandated Pacific Islands

Territory and Area Square Miles	Population and Status	Principal Products	Imports and Exports (000's omitted)	Revenue and Expenditure (000's omitted)
EW GUINEA, mandated territory (69,700) including Bismarck Archipelago (19,200) and Solomon Is (4,100)	304,445 (white, 4,445) Under Mandate of the Commonwealth of Australia	(1937–38) gold £2,028,980; copra £847,734	(1937–38) imp. £1,611 exp. £2,980	(1937–38) rev. £A506 exp. £A509
ESTERN SAMOA	59,306 (white, 412) Under Mandate of New Zealand	(Export 1938. copra 11,241 tons; bananas 7,347 tons	(1938) imp. £196 exp. £249	(1938–39) ev. £124 exp. £119
ARIANNE IS., CAROLINE IS., PALAN, and MARSHALL IS. (811)	107,137 (Japanese, 56,496) Under Japanese Mandate	(1936) cane sugar 49,100 net tons; phosphates 84,973 net tons	(1936 imp. 13,866 yen exp. 25.108 yen	(1939) rev. 9,904 yen exp. 9,675 yen
AURU (8)	3,385 (European 187, Chinese 1,516) Under British Mandate, held jointly by Great Britain, Australia, and New Zealand	(1938) natural phosphates 841,050 tons	(1938) imp. £A272 exp. £A547	(1938) rev. £A29.4 exp. £A30.3

acific Relations, Institute of. The institute is an international organiza- on founded in 1925 for the study of the peoples of the Pacific d their mutual relations. It conducts an extensive research and ucational program, and publishes its studies through an international publications office, and through each of its national councils; it produces a quarterly magazine, *Pacific Affairs*. Since 1937 it has carried on an international inquiry into problems arising from the Sino-Japanese conflict. The last international meeting of the institute was held in Nov. 1939, at Virginia Beach, Va. Acting chairman of the Pacific council, governing body of the institute, is Prof. Philip C. Jessup. Offices of the international secretariat are temporarily at 129 East 52nd street, New York city. Below are the 11 member organizations:

The American council, Institute of Pacific Relations, 129 East 52nd street, New York city. Royal Institute of International Affairs, Chatham house, St. James's square, London, S.W. 1, England. Australian Institute of International Affairs, 53 Martin place, Sydney. Canadian Institute of International Affairs, 3 Willcocks street, Toronto. China Institute of Pacific Relations, P.O. Box 1688, Kowloon, Hongkong. Comité d'Études des Problèmes du Pacifique, Lycée Blaise-Pascal, Clermont-Ferrand, France. Japanese council, Institute of Pacific Relations, Nihon Kokusai Kyokai, 12, 2-chome, Marunouchi, Tokyo. Netherlands-Netherlands Indies council, Institute of Pacific Relations, 18 Warmonderweg, Oegstgeest bij Leiden. New Zealand Institute of International Affairs, P.O. Box 36, Wellington. Philippine council, Institute of Pacific Relations, Vicente Madrigal & Co., Muelle del Banco, Manila. U.S.S.R. council, Pacific Institute, 20 Razin street, Moscow. (F. V. F.)

Pacifism. Pacifism is a system of beliefs in the desirability and possibility of permanent peace. This belief may be based on liberal-humanitarian, rational-cosmopolitan or religious grounds. It always presupposes a belief in the essential unity of mankind and in the sanctity and dignity of individual existence. It is thus completely opposed to fascism which denies the oneness of mankind and the dignity of the individual and which regards permanent peace as neither possible nor desirable, because war alone, according to fascism, awakens the highest moral response in man. The communist attitude rejecting only certain wars which they label "imperialist" or "capitalist," cannot be regarded as pacifist, although communism foresees as an ultimate ideal a pacifist and unified society. Entirely unpacifist is the isolationist or neutral attitude, which is based upon the sole consideration of national self-interest, and does not reject war on principle, but only if it does not involve the nation's own honour, security or wants. An isolationist or neutral attitude is unpacifist also because it does not point any way towards the establishment of a peace embrac-

TRIBUNAL for conscientious objectors in session at London in 1940

ing all nations on a permanent structure of international law.

Pacifism can be either "absolutist," rejecting all and every kind of war under every circumstance, or "juridical," aiming at settling all disputes between nations judicially, by the authority of international law, backed by the necessary power. Absolutist pacifists are represented by a number of war resisters and religious groups.

Their members refuse military service as "conscientious objectors."

Following the outbreak of the European war, the British government in 1939 and, with the introduction of compulsory military service in 1940, the United States, took this attitude into consideration and recognized it officially. Conscientious objectors received the right to argue the sincerity of their convictions before special tribunals and be then assigned to noncombatant service and exempted from military duties. In spite of the fact that Great Britain found herself in the midst of a life-and-death struggle in 1940, she and Canada put no restriction upon any form of pacifist propaganda.

Pacifism, which believes in attaining peace by concerted peace efforts of all peace-loving nations, believes that no nation can be assured of living its own life in peace in a world of lawlessness and anarchy. It therefore affirms the necessity for all nations to co-operate in the organization of an international community for concerted action to oppose aggression. It regards isolationism as one of the fundamental obstacles to such an establishment of a peaceful order. The war, which in 1940 saw attacked many nations anxious to remain isolated and neutral, and saw many of them disappear as independent nations (in 1940 eleven neutral nations were attacked outright or in one way or another [wholly or in part] annexed), strengthened the conviction in many circles of the necessity of establishing a strong international order.

The proposal of *Union Now* made by Mr. Clarence Streit for a federation of all democratic nations found itself, as a result of events, reduced to a proposal for a union of the English-speaking nations to withstand the common danger of a fascist-dominated world and to lay the foundations of a lasting peace and of civilized order. With the spread of the war the demand for a lasting peace grew as it had during the war of 1914–18, but this time the determination grew, too, not to let the opportunity go by default, as had happened after 1918 by the refusal to enter or to use the League of Nations. (*See* also INTERNATIONAL LAW; RELIGION.)

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Packaged Fuel: *see* FUEL BRIQUETTES.

Packing Industry: *see* MEAT.

Painting. The year 1940 was marked by two developments which will undoubtedly have an important influence on future trends in American painting. On one hand, the influx of prominent artists from Europe was notably increased; on the other, an energetic, propagandist effort was initiated to awaken and increase interest in western hemisphere art.

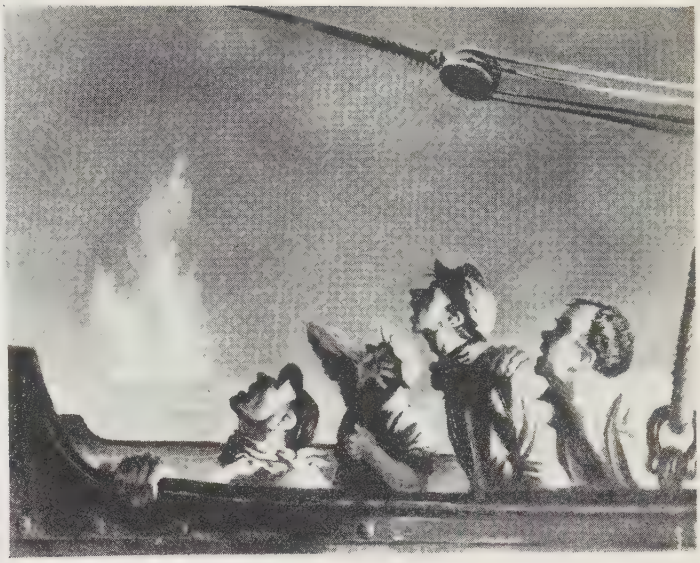
The movement of painters from east to west had been going on steadily for the past decade. In fact one may even see its origin in the early 1920s when the Russian soviet's discouragement of the Moscow constructivists and so-called "formalistic" painters led to the dispersal of many of their leaders through Germany and France. During the 1930s nazi Germany's campaign against the unconventional in pictorial expression as "degenerate art" swelled the movement. For several years Great Britain had provided a handy haven of refuge and enjoyed a considerable stimulus from the influences driven to its hospitality. With Britain a centre of war the United States became the obvious resort. Already several well known European artists and many younger experimenters had settled in the U.S.A.: among others Pavel Tchelitchew, L. Moholy-Nagy, Amedée Ozenfant, Jean Hélion, Yves Tanguy, Matta Etchaurren and Kurt Seligmann. During 1940 these were followed by the Spanish surrealist Salvador Dali, the Dutch neo-plastician, Piet Mondrian and Fernand Léger. Wyndham Lewis, the well known British critic and former vorticist painter, spent several months in the United States during the spring and summer of 1940, painting, writing and lecturing; and in the autumn the etcher, William Hayter opened a class at the New School for Social Research in New York where Amedée Ozenfant was also lecturing.

At the same time throughout the United States many ambitious exhibitions of Mexican, Central American and South American works were arranged. The Riverside museum in New York city, one of the pioneers in this field, in the summer of 1940 held an exhibit of work from five Pan-American countries: Ecuador, Venezuela, Brazil, Mexico and the Dominican Republic. At the same time, in San Francisco, the Golden Gate exhibition was showing a special Pan-American display representing Colombia, Chile, Costa Rica, El Salvador and Peru. The Virginia Museum of Fine Arts at Richmond held a large exhibition dedicated solely to Argentine art; and in Denver was shown a comprehensive display of 16th, 17th and 18th century paintings of the school of Cuzco, Peru. During the late spring and summer months the Museum of Modern Art in New York city held an exhibition of 2000 Years of Mexican Art. In the autumn the same institution gave a generous one-man show to the Brazilian painter Cândido Portinari; while a large exhibition of the work of the Colombian Luis Alberto Acuña was held in San Francisco.

Another feature of note in 1940 was the diminished emphasis on "American scene" and "regionalist" interests in subject matter. And by the end of 1940 the curtailment of the WPA arts project patronage which was already pinching in 1939 had practically rendered that organization ineffectual. To make partial amends to the artists for the diversion of funds from the WPA to uses the government felt more immediately urgent, the administration instituted a national art week. This was planned to stimulate the market for native artists' work; but the apparent inexperience of its active organizers in many centres seriously limited its benefits.

In the creative field, in the season of 1940 just as in that of 1939, it was possibly the veteran John Marin who provided some of the most gratifying achievements: and once again seascapes in oil—in 1940 on the New Hampshire coast. Each year sees in Marin a growing mastery of this medium to which he has given his prime attention so late in life. And in these oils one finds all the vitality and spontaneity of his water colours with

"SAILOR FROM H.M.S. VERNON," by Eric Kennington, commissioned by the British admiralty in 1940



"DEATH FROM THE AIR," by Georges Schreiber, American, records the fears of crew members aboard a British munitions ship during an attack by a German bomber

THOMAS HART BENTON'S "No More Sea for Me" was a notable war painting of 1940. It pictures a crew refusing to risk the dangers of shipping in wartime. This canvas and "Death from the Air" were purchased by Walter Wanger for exhibition throughout the United States

"RETURN OF H.M.S. EXETER" by Charles Cundall, A.R.A., painted and purchased officially in 1940. The "Exeter" was one of the three British cruisers which won the victory over the German pocket battleship "Admiral Graf Spee" in Dec. 1939

steadily growing power of definition—an added warmth and richness of colour and an increased feeling for the structure of the whole. Another well known exhibitor at Alfred Stieglitz's An American Place, who brought a new note into her work in 1940 was Georgia O'Keeffe. In her 20 paintings of Hawaiian flora commissioned by the Dole Pineapple company one marked an unusual freshness. No sacrifice of her characteristically meticulous workmanship was evident. Still in these canvases there was a luxuriance with a suggestion of freedom that left a promise of new paths that might be explored.

However, if Marin's consistently more profound mastery of the oil medium and O'Keeffe's new warmth and richness were among the high points of the year's production, several younger artists and even newcomers were not without their marks. Probably no American artist in several years has received a broader and more deserved recognition for his work from a single small exhibition than Julian Levi for his spring offering at the Downtown gallery in New York. It was evident that here was a man with deep knowledge of craftsmanship, and an instinct for colour effects and structural organization that allowed him to speak freely in paint without any danger of producing a slipshod untidy expression. From this showing one had an impression of spontaneity together with the sense of an essential compositional integrity in his painting; and both these effects were combined by a bright sunny palette that gave nothing, however, to shallowness for the sake of vivacity.

At the other pole of expression there was the exhibition Charles Sheeler's six studies in oil on the subject of "Pow commissioned in 1938 by *Fortune* magazine and shown in the of 1940 at the Downtown gallery. In these canvases Sheeler tained all the tight spotlessness of his machine depictions. late years Sheeler's expression has been shrinking scrupulously a more and more minute elegance. But here it would appear t at a single bound he has shaken off this temptation. And in t sense he seems to have completely recovered his earlier breat without surrendering any of the confidence his effects of mic scopic veracity brings. At the same time he has immersed forms in a suffused light that gives them a new mellowness. T result is that these six studies have a strength and sensibility t linked to Sheeler's old impeccable craftsmanship put them h among that artist's work, if not at the top.

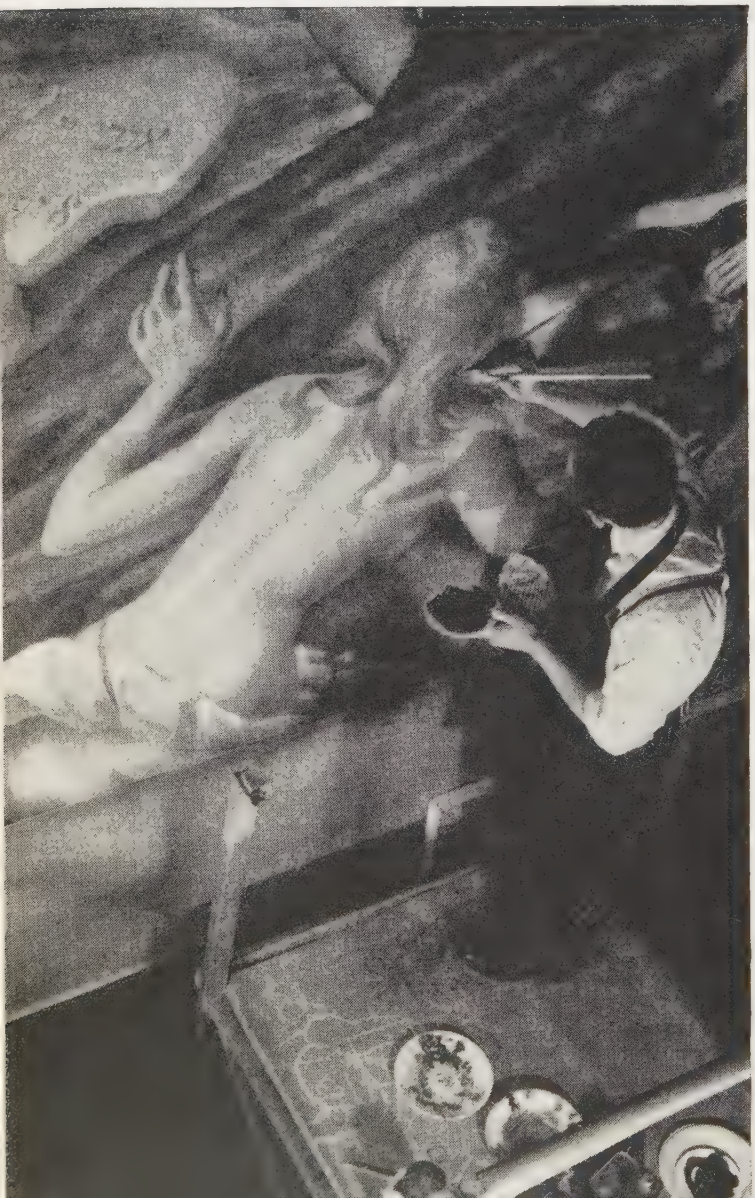
In another world from both the sensuality of Julian Levi's w and the Puritanism of Sheeler's stands the 1940 sculpture Alexander Calder. And while Calder's talent is never without s prises, his exhibition at the Matisse gallery in the spring "Mobiles and Stabiles" showed a new and important step tow the monumental in metal sculpture. The forms, if anything, b become more personal. Whatever notes reminiscent of Paris m occasionally have cropped out in earlier expressions, here had tirely disappeared. The nature of his materials and his mode construction had more closely prescribed the shapes here than any work to date. The gay colours of his earlier mobiles had giv way for the most part to a mat block, more reserved and, at t same time, more authoritative. (*See* SCULPTURE.)

Among the lesser known younger artists Loren MacIver in h exhibition of delicately drawn fantasies at the Pierre Mati Galeries in December offered perhaps the most interesting prom of the year. She is rich in imagination and courageous in the u of it. However, her colour is still not sure enough. She appa ently lacks a confidence in her ability to handle a strong gam and tries to make up for it by a stress on quality and sensibili

Another artist who is likewise strong in sensibility but sha MacIver's timidity of colour is Milton Avery. His exhibiti at the Valentine gallery during the spring had a definite char and was rich in suggestive quality but lacked an essential vit ity. On the other hand, in the work of Ernest Fiene who in t spring of 1940 held his large first one-man show since 1935, a in Marsden Hartley's Maine landscapes shown at the Walk galleries, one found an abundance of vitality together with a la of feeling for nuances of colour and for restraint. And in t work of Benno, just back from Paris, one felt an interesting ric ness of compositional and technical ingenuity joined to lack self-criticism.

In New York during 1940 the non-objective painters and scul tors enjoyed increased exhibition opportunities. The Museu of the Art of Tomorrow gave over a small space to period showings of non-objective painters. Of this group one of the mo consistently interesting was John Xceron. The group of Ame can Abstract Artists in 1940 held their annual exhibition in t large galleries adjoining the Art Students league including t work of architects as well as painters and sculptors. Of t paintings shown, the most striking was a composition by Ali Mason. Ilya Bolotowsky and Balcomb Greene also contribute characteristic work.

However, by far the most interesting display of contempora non-objective work was that shown at the St. Etienne galler Here broad catholicity of inclusion brought together work



FOUR MURAL PANELS tracing the history of printing, painted by Edwa Laning, were completed in 1940 for the New York public library

art Davis, Albers, Moholy-Nagy, Rice-Pereira, G. L. K. rris, Susie Frelinghuysen, Charles Smith, Burgoyne Diller and nel Feininger. Moholy-Nagy's constructivist relief with its phasis on the play of lights, shades, colours and textures, was ly the most competent and satisfying of the work exhibited; le Burgoyne Diller's translation of the two-dimensional cts of neo-plasticism into a three-dimensional construction perhaps the most suggestive contribution of the younger ibitors.

n the deaths of Ernest Peixotto and of Jonas Lie, American nting in 1940 lost two of the figures of the older generation t known for their activities on behalf of their fellow artists; in that of Jerome Myers, one of the best known members of t group which included the late Glackens and Luks and was ted in its work so intimately with the New York of the open- of the century. (J. J. Sw.)

ints and Varnishes. United States sales for the year 1940 showed a slight increase over 9. Industrial sales showed more gain than trade sales during year.

igments showed continued improvement in quality. The lk-retardant types of titanium oxide particularly have better our. Phthalocyanine blues and greens became more and more ular. Among the inorganic colours the chrome and molybdate ments with improved light fastness became available. The anthrene and cadmium colours became increasingly popular, ecially for automotive finishes. The ease of dispersion of ny pigments was greatly improved. This was secured through face-treatment, more selective mechanical separation, and, he case of certain mineral pigments, through micronizing.

Vehicles in general received a great deal of attention during year. In oils, dehydrated castor and the re-esterified fish l oils showed greatly increased consumption as replacements imported China wood and perilla oils. Considerable attention s given to the utilization of petroleum products as the basis synthetic drying oils for the industry. Removal of natural i-oxidants from soybean oil received particular attention.

A synthetic dibasic anhydride prepared from cyclopentadiene l maleic anhydride appeared as a replacement for phthalic an- lride in the popular alkyd type of resin.

In the heat-convertible resin field melamine formaldehyde has ne forward as a replacement of the urea formaldehyde type baking goods, particularly whites. Among painter items im- vements were made in reducing the odour of paints. More and re non-penetrating types of materials have appeared for use porous surfaces, such as calcimined surfaces.

In the industrial field much attention was given to the subject infrared baking. This type of baking, inaugurated by the tor industry several years ago, made tremendous gains in popu- ity during 1940. In general, it was most effective when used conjunction with heat-convertible resins such as the urea or lamine types, although results could be secured with those terials that gained hardness by oxidation. A wide variety of n design was available to accommodate the type of article and ure of finish desired. Both low-temperature tungsten and bon filament bulbs were used in conjunction with several types reflecting surfaces.

During 1940 the industry contributed to the defence effort in eloping and supplying fast-drying finishes for all divisions the armed forces. Particular emphasis was placed on non- ecting types of paints such as lustreless olive drab for motor- l equipment, helmets, etc. A variety of matte colours was ilable for aircraft camouflage.

(See also ELECTRIC LIGHTING.)

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(A. B. Ho.)

Palaeontology. In the United States many contributions have been made to the advancement of vertebrate palaeontology. William B. Scott and Glenn L. Jepsen published *Artiodactyla,* a notable contribution to a knowledge of this portion of the Oligocene mammalian fauna of North America. This extended work is embellished by 42 excellent plates illustrating the more important skeletal parts of the various animals discussed in the text. Glenn L. Jepsen described five new genera and eight new species of Palaeocene mammals from a northern Wyoming locality. It is pointed out that the geological section here contains the approximate equivalents of the major Palaeocene faunas known elsewhere. George Gaylord Simpson contributes a series of eight brief studies on Palaeocene and Eocene primates. New genera and species are described, relationships of certain forms are discussed and their classification revised. C. Bertrand Schultz and Charles H. Falkenback published on the Merycochocrinae. This is the first of a proposed series on the Merycoidodonts of North America, each subfamily to be treated separately. The abundance of materials at their command assures the importance of this contribution. Charles W. Gilmore published a short paper characterizing two new fossil lizards from the Upper Cretaceous of central Utah. The dentition of these forms is unique in the order Sauria. *O. C. Marsh, Pioneer in Paleontology,* by Charles Schuchert and Clara M. LaVene, is a volume of great interest to all palaeontologists. The story of Marsh is in some respects the tale of the growth of science in American universities. It is a most candid and dispassionate evaluation of Marsh as a man, his relationships and accomplishments.

A large, toothless bird *Caenagnathus collinsi* from the Upper Cretaceous of Alberta, Canada was described by R. M. Sternberg. It is referred to the new order *Caenagnathiformes.* Its large size suggests it to be a flightless bird that lived in an upland habitat. A revised edition of *A Systematic Classification for the Birds of the World,* by Alexander Wetmore, includes all known fossil birds and for that reason is of interest to palaeontologists.

In Russia, A. P. Bystrow and J. A. Efremov published a complete osteological description of *Benthosuchus sushkini,* a labyrinthodont from the lower Triassic. The specimens forming the basis of this study came from Sharzhenga river, a tributary of the Yuk in the North Dvina region.

In Japan, Shigeyasu Tokunaga and Fuyuji Takai completed a study of the Pleistocene antlered mammal *Metacervulus astylodon* from the Pleistocene of the Ryukyu islands. An abundance of materials enables them to discuss practically the entire skeleton.

In invertebrate palaeontology, C. W. Merriam revised the Devonian faunas of the famous Eureka district of Nevada. Special attention was given to establishing these faunas in the geological section. This work thus modernizes the palaeontological information of this area. A considerable number of new species are described. A. K. Miller and W. F. Furnish reviewed the Permian ammonoids of the Guadalupe mountain region of western Texas and adjacent areas. Some new forms were also described. The publication of a revised third edition of *Foraminifera, their Classification and Economic Use,* by Joseph A. Cushman, is a volume of interest to students and specialists alike.

The discovery of additional materials of early man in the Sangiran district of Java enabled Dr. Franz Wiedenreich to present a new restoration of the *Pithecanthus erectus* cranium. He concludes that there is now no doubt that it represents the most primitive man yet discovered. (*See* also GEOLOGY; ZOOLOGY.)

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(C. W. GI.)

Palestine. Palestine lies on the western edge of Asia, being bounded on the west by the Mediterranean, on the southwest by Egypt, on the south by the gulf of Aqaba, on the east by Trans-Jordan, on the northeast by Syria and on the north by the Lebanon. Area 10,429 sq.mi.; (water 272 sq.mi.); pop. (est. June 30, 1939) 1,466,500; immigration 1938: Jews 12,868; Arabs 473; others 1,922. Chief towns: (pop. est. 1939): Jerusalem (cap. 129,800); Haifa (104,800); Jaffa (77,400); Tel-Aviv (130,300). High Commissioner: Sir H. A. MacMichael, K.C.M.G., D.S.O.; languages: English, Arabic, Hebrew; religions: (1939) Mohammedan 848,933; Jewish 424,373; Christian 114,624.

History.—The complete cessation of unrest, which marked the last quarter of 1939, continued throughout 1940 with the exception of a short interlude at the beginning of March when Jewish demonstrations took place in consequence of the promulgation on Feb. 28 of the regulations provided for in the *White Paper* for the delimitation of zones in which sales of land would be restricted, prohibited or remain free.

In view of the improvement in the state of public security the high commissioner announced that all offences prior to June 15 would not come before the military court and that the death penalty for carrying arms without licence would be abolished.

Palestine felt the first direct effects of the entry of Italy into the war on July 15, when the first air-raid on Haifa took place. This was followed on July 24 by a second, which caused 100 casualties, and on Aug. 6 by a third. On Sept. 9, Tel-Aviv was raided and over 100 casualties were caused.

Recruiting during the year proceeded apace for the ground forces of the royal air force, and for auxiliary pioneer companies, one of which went out to France in the spring. On July 2 the decision was announced to form artisan workers companies for the royal engineers, a line section for the royal corps of signals and mechanical transport companies for the royal army service corps and additional pioneer corps. And in September Palestinians were called upon to offer their services for the defence of Palestine in combatant units. Enlistment was very brisk among both Jews and Arabs. The second Australian imperial force began to arrive in Palestine in February.

There was a considerable decrease of immigration due partly to the small number of certificates granted and partly to the very reduced number of Jews left in the European countries from which the bulk of immigrants had hitherto come. Applicants for certificates had to prove that they had no longer been in enemy countries in Sept. 1939. The falling off in immigration can be gauged from the fact that, whereas the total during the first half year of 1939 was 11,911, in the same period of 1940 it was only 3,933, the Jewish proportion falling correspondingly.

Unemployment was remarkably low, considering the serious economic situation caused by the war. This satisfactory feature was due largely to the construction of roads and camps for the army, to the carrying out of the extensive barrack-building program for the police and to recruiting.

The granting by the British government of £P.750,000 for relief work materially assisted also. These loans were granted to all municipalities including Tel-Aviv, Haifa, Jaffa and Jerusalem, to small Arab villages and to small Jewish colonies for the carrying out of public works. The government finances remained sound. The actual income for the first half of 1940, if one leaves out of consideration the Colonial Office grant-in-aid, was higher by £P.400,000 than during the same period of 1939.

Import trade during the first half of 1940 was fully up to the 1939 standard. In view of the war, merchants decided to accumulate stocks and more raw material was required to enable local industries to meet military needs and for the new industries created to provide manufactured articles hitherto supplied fr abroad. The economic situation was, however, aggravated by difficulty experienced in exporting the citrus crop which become the staple crop of the country. Only 7,500,000 ca half the quantity exported the previous season, were shipp The bulk of the cases went to the United Kingdom.

In March all the finance regulations in force were consolidat Palestine belonging to the sterling block, transfers between Empire and Palestine are free and it was for this reason tha movement took place to get the British government to arrange the taking over by British brokers of the citrus crop in the sa way as had been arranged for the cotton crop in Egypt.

On April 16, the government announced that to assist Palestine citrus industry it would under certain conditions gu antee advances made to citrus growers. This guarantee limited to half the loans granted to citrus cultivators during coming season. At the same time a reduction in the rural-pro erty tax from £P.40 to £P.15 was accorded to estates devoted citrus cultivation. In July a draft bill for a citrus control bo was promulgated. It provides for 100% control of the indust from the tree to the broker abroad and will regulate the a under citrus cultivation, the quality of the fruit, standards packing, grading and marketing, shipping and export allocati

During the year an industrial production advisory board w formed to utilize local industrial enterprises to the fullest a vantage for civil and military purpose, to control the impo and supply of raw material and the price of local manufactur and to advise the military and civil administration regardi contracts for supplies and the extent to which they can draw local resources. An indication of the increased industrial activi in Palestine during the first half of the year is afforded by t fact that the consumption of electricity expanded from 35,500,0 to 48,000,000 kw., the sales of power to industries increasing fr 10,700,000 to over 18,000,000 kw.

Another curious statistical feature due no doubt to the war a the greater tendency of the public to listen in for news, is th the number of radio sets in use rose from 15,000 in 1935 to 46,6 in 1940.

Palestine did not fail to be affected by the events in Syri The closing of the frontier materially affected economic rel tions as the two countries are in many respects inter-depende Conversations were proceeding for some *modus vivendi* whi would enable trade intercourse, particularly in agricultural pro ucts, to be resumed.

Italian and German propaganda was very active, as elsewhe in Arabia. The fighter aircraft fund organized by the Jewi newspaper the *Palestine Post* may be regarded as a practical pro of the failure of enemy propaganda and of the will to assist the whole community of Palestine. It produced a sum of ov £P.30,000, to which both Arabs and Jews freely contribute The success of the appeal was all the more remarkable in vie of the economic situation of Palestine. (A. Mn.)

Education.—1937–38: Arab public system maintained by go ernment, 402 schools (11 with secondary sections), 49,000 sch ars; Moslem schools, private 184 (2 with secondary sections) wi 14,052 scholars; Jewish schools 662 (including 6 training colleg and 27 secondary, 14 technical and 13 agricultural schools) wi 71,376 scholars; Christian schools 193 with 24,046 scholar Hebrew university, Jerusalem; 75 teachers, 733 students.

Banking and Finance.—Revenue and expenditure (est. 1939 40) £P.7,073,733; public debt (March 31, 1939) £P.4,475,00 surplus balance (April 1, 1939) £P.2,533,265; notes in circulatio (June 30, 1939) £P.5,931,967; exchange rate: £P.1=£1 sterlin

Trade and Communication.—Overseas trade 1939 (merchan dise): imports (excluding military stores) £P.14,632,822; export

nestic £P.5,117,769. Communications and transport 1939: ds, all weather 1,110 mi.; seasonable about 1,100 mi., rail-rs, standard gauge 334 mi.; narrow 270 mi.; airways (1938): sengers 600, mail 86·9 tons; shipping, 1938 entered 1,971 sels; 5,201,473 net tons. (Dec. 31, 1938) Motor vehicles li-sed: 3,935 private cars, 1,031 public cars, 750 buses, 2,592 cks and vans, 1,182 cycles; wireless receiving set licences 708; telephone subscribers, number 9,241.

Agriculture and Minerals.—Production 1938 (in metric s): potash (exports) 50,288; oranges (exports 1938–39) 13,-420 cases, (value) £P.3,865,292; barley 66,736; wheat (1938) 435; (1939) 136,100; olive oil (exports) 78,977; melons and ermelons 114,805; grapefruit (exports 1938–39) 2,066,833 es, (value) £P.445,148; wine 31,000 hectolitres; maize 8,000; acco (1937) 2,500; potatoes (1937) 9,500; sesamum 4,000.

lmer, Emma Nevada: *see* NEVADA, EMMA.

namá, a republic at the juncture of Central and South America; language, Spanish; capital, Panamá; president, Arnulfo Arias; area, including the Canal Zone (under United tes jurisdiction) is 34,169 sq.mi. The population (1930 cen-: 467,459) was officially estimated at 547,536 in 1937. Results the Sept. 8, 1940 census had not been made public at the d of the year, but semi-official estimates were 625,000 to),000, not including the Panama Canal Zone (1940 census: 827. The chief cities (with 1930 pop.) are: Panamá, 82,827; lón, 33,460; Penonomé, 16,074; David, 16,004.

Throughout 1940, Panama was unsettled politically. A bitter npaign preceded the June 2 presidential elections. Just before elections, the opposition candidate, former president Ricardo Alfaro, withdrew, charging that frauds made free election im-ssible. Dr. Arnulfo Arias, 39-year-old administration candi-e, was elected without formal opposition, and assumed office Oct. 1. One of his first acts was to push through a new con-ution, effective Jan. 2, 1941. This changed the presidential m from 4 to 6 years, disfranchised non-Spanish-speaking groes, prohibited further immigration of Asiatics or Africans, d generally strengthened presidential powers. Legality of the ocedure followed in adopting the new constitution was strongly llenged by opponents.

During 1940, strong action was taken against "fifth column" ivity which threatened the Panama canal defence program. ited States expenditures on additional canal defences and ending of a heavily increased canal personnel stimulated busi-ss in the republic, and was considered to have more than offset ses from a decline in tourist trade, normally a major source national income.

In 1939 there were 257 mi. of railway and 1,169 km. of high-y. Panama's strategic geographic position makes her the hub of er-American air and maritime transport. In 1940 construction s begun on the highly important intercoastal highway; when mpleted this will connect Panamá and Colón by road for the st time. A United States Import and Export Bank loan of ,000,000 made possible continued work on incomplete sections the Pan-American highway. Panama's merchant marine, one of e largest in Hispanic America, has trebled since 1938, and to-lled in 1940 nearly 200 ships aggregating close to 900,000 gross ns.

Imports, chiefly textiles and foodstuffs, were $20,464,000 in 39 (a 16% increase), with the United States supplying 58·2%, pan, 9·8%, Germany 7·9%. Exports (exclusive of $3,339,000 re-ports) declined 7% to $3,487,000 (85·8% to the United States). nanas comprised 79%.

In 1939 there were 629 primary schools (544 rural), with 61,706 pupils and seven secondary schools (3,830 enrolment). The National university (411 students in 1939) is at Panamá. Panamá has no army or navy, but maintains a national police force of 1,200.

The monetary unit, the balboa, is equivalent to the United States dollar. (*See* also HISPANIC AMERICA AND THE EUROPEAN WAR.) (L. W. BE; L. C. DE A.)

Panama Canal and Canal Zone. Area, 552·95 sq.mi., of which 190·94 are water; population, as of the 16th decennial census taken April 1, 1940, inclusive of army and navy personnel, 51,827, of whom 32,390 were United States citizens. The length of the canal from shore line to shore line is 40·27 miles. Both canal and zone are under the jurisdiction of the United States.

The Panama canal connects the Atlantic and Pacific oceans through the narrow isthmus of Panama, at approximately 9° N. lat. and 79° W. long.

It was opened to traffic on Aug. 15, 1914.

Revenues for the fiscal year 1940, principally from tolls, totalled $22,329,610 and the net appropriation expenses were $10,-041,950, which left a net revenue of $12,287,660, or a return of 2·42%, to the U.S. government on its investment in the canal enterprises. The gross capital investment as of July 1, 1939, was $543,150,445, and the net investment, after deducting reserves, $508,107,922.

An interest return of 3% on the capital investment would have been $15,243,238 from the year's operations, or $2,955,578 more than was actually realized.

During the fiscal year ended June 30, 1940, there were 5,370 transits of ocean-going commercial vessels in comparison with 5,903 in the fiscal year 1939. Of the total number of commercial transits during the fiscal year ended June 30, 1940, 1,997 were of the United States registry, 1,073 British, 557 Norwegian, 340 Netherlands, 272 Japanese, 243 Panamanian, 175 Greek, 174 Danish, 110 Swedish, 93 French, 81 Honduran, 55 German, 46 Italian, 38 Chilean, 27 Yugoslav and the remaining 89 of 14 other nationalities.

The origin and destination by principal trade areas of cargo in vessels passing through the Panama canal during the fiscal year ended June 30, 1940, is shown in the following table:

From Atlantic to Pacific	*Cargo, tons*
United States intercoastal	2,795,708
United States and Far East (including Philippine Is.)	3,266,445
Europe and South America	259,700
Europe and Canada	44,402
Europe and United States	192,374
East coast United States and west coast South America	501,511
Europe and Australasia	268,143
United States and Australasia	487,896
All other trade routes	2,003,421
Total	9,819,600

From Pacific to Atlantic	*Cargo, tons*
United States intercoastal	4,918,629
Far East and United States (including Philippine Is.)	1,589,165
South America and Europe	1,474,874
Canada and Europe	2,006,622
United States and Europe	1,099,296
West coast South America and east coast United States	2,757,412
Australasia and Europe	864,701
Australasia and United States	135,639
All other trade routes	2,624,078
Total	17,470,416

During 1940 there was a great increase in local activity in the Canal Zone. The total force employed by the Panama Canal and Panama Railroad company in June 1940 was 5,258 on the "gold roll," and 18,891 on the "silver roll." As compared with June 1939 this represents an increase of 1,747 or 41% on the "gold roll," and an increase of 7,645 or 68% on the "silver roll." The terms "gold roll" and "silver roll" originated during the construction period of the canal from the practice of paying the American skilled labour in gold and the paying of the native unskilled labour in silver. This classification has been continued to the present time, although all employees are now paid in U.S. currency.

The gold roll comprises the supervisory, technical, higher clerical and highly skilled mechanical employees; these employees are, with a few exceptions, citizens of the U.S.

Traffic through the Canal for the Last Twelve Fiscal Years

Fiscal year ending June 30	Southbound (Atlantic to Pacific)		Northbound (Pacific to Atlantic)		Total		Tolls levied
	Vessels*	Cargo, tons	Vessels*	Cargo, tons	Vessels*	Cargo, tons	
1929	3,279	9,873,529	3,010	20,774,239	6,289	30,647,768	$27,111,125
1930	3,051	9,472,061	2,976	20,546,368	6,027	30,018,429	27,059,999
1931	2,717	6,670,718	2,653	18,394,565	5,370	25,065,283	24,624,600
1932	2,273	5,631,717	2,089	14,167,269	4,362	19,798,986	20,694,705
1933	2,184	4,507,070	1,978	13,654,095	4,162	18,161,165	19,601,077
1934	2,753	6,162,649	2,481	18,541,360	5,234	24,704,009	24,047,183
1935	2,676	7,529,721	2,504	17,779,806	5,180	25,309,527	23,307,063
1936	2,770	8,249,899	2,612	18,256,044	5,382	26,505,943	23,479,114
1937	2,865	9,895,632	2,522	18,212,743	5,387	28,108,375	23,102,137
1938	2,946	9,088,560	2,578	17,097,364	5,524	27,385,924	23,169,889
1939	3,146	9,011,267	2,757	18,855,360	5,903	27,866,627	23,661,021
1940	2,763	9,819,600	2,607	17,479,416	5,370	27,299,016	21,144,675

*Ocean-going commercial vessels, over 300 net tons Panama canal measurement, excluding canal vessels, Army and Navy, Panamanian Government, Colombian Army and Navy vessels.

The force of silver employees is comprised almost entirely of natives of the tropics, a considerable number of whom are Panamanians.

The principal commodities transported through the canal during the fiscal year ended June 30, 1940, segregated by direction of transit, were as follows:

From Atlantic to Pacific	*Long tons*
Manufactures of iron and steel	1,837,593
Mineral oils	1,294,886
Scrap metal	968,045
Paper and paper products	394,021
Sulphur	353,452
Coal and Coke	330,542
Metals, various	316,627
Cotton, raw	277,978
Tinplate	243,784
Phosphates	220,647
Machinery	205,210

From Pacific to Atlantic	*Long tons*
Lumber	3,669,482
Ores	2,165,646
Mineral oils	2,014,237
Sugar	1,455,683
Nitrate	1,361,422
Canned food products	1,248,059
Metals, various	706,001
Wheat	611,961
Food products in cold storage (except fresh fruit)	444,291
Fruit, dried	275,637
Wood pulp	275,350
Oils, vegetable	211,457

This increase in local activity evidenced by the working force is due to the construction activities on the Canal Zone for national defence projects of the U.S. army and the U.S. navy, and the project for the improvement and enlargement of the capacity of the Panama canal by the building of the third set of locks. This latter project involves the construction of a complete new set of locks at Gatun, Pedro Miguel and Miraflores, with by-pass channels paralleling the existing facilities. Preliminary studies on this project were begun in the fiscal years 1939 and 1940, and with the passing of the congressional appropriation on June 24, 1940, construction work on the third locks project was officially inaugurated on July 1, 1940, the first day of the fiscal year 1941. (G. E. Ed.)

Pan-American Highway: *see* Bolivia; Costa Rica; Guatemala; Honduras; Nicaragua; Panama; Peru; Roads and Highways; Salvador, El.

Pan American Union, an international body created and maintained by the 21 western hemisphere republics for the fostering of good understanding, friendly intercourse, commerce and peace; headquarters, Washington; director general, Dr. Leo S. Rowe.

On April 14, 1940, the Pan-American union celebrated its 50th anniversary.

During 1940 the most outstanding union activity was the second meeting of the ministers of foreign affairs of the American republics, held at Havana, July 21 to 30 (*see* Hispanic America and the European War). Throughout the year the Inter American Financial and Economic Advisory committee, created at the first meeting (at Panama City, Sept. 1939) continued to function. It formulated a convention creating an Inter American bank and was responsible for the important Inter American Coffee Quota agreement of Nov. 1940 (*see* Brazil). Under its auspices an Inter American Marit conference was held at union, Nov. 25 to Dec. 2.

Several other union-sp sored inter-American con ences were held during 19 including the Fourth Pan Am ican Red Cross confere (Santiago, Chile, Dec. 5 to 1 and the committee of expe on nature protection and w life protection, at Washing in May, which drafted international convention proved by 12 republics fore the end of the year.

Sixteen inter-American conferences and congresses were sch uled to be held during 1941. These included the regional co ferences of Río de la Plata countries (Montevideo, Jan. 1 an Inter-American Writers conference (Río Piedras, Puerto Ri April 14), and the Fourth Pan American Highway congress (M ico City, Sept. 15 to 24), as well as meetings devoted to oth special problems. The union is financed by contributions fr member republics on a population basis. It has several importa subdivisions devoted to specialized activities, including a divisi of labour and social information established Jan. 1, 1940.

Bibliography.—Pan American Union, *Bulletin; Commercial Pan Am ica; Pan American bookshelf* (in English, Portuguese and Spanish editio Washington, monthly). (L. W. Be.)

Paper and Pulp Industry. The pulp and paper indust in the United States in 19 was featured by the war conditions and increased business resu ing therefrom. Paper production in Dec. 1939 was at about 91·1 of capacity and by Oct. 1940 was 88·5%. Paperboard duri the same period rose from 70% to 74%. During 1940 thr new mills were brought into operation; a newsprint mill at Lufk Tex., a cigarette paper mill at Brevard, N.C., and a kraft mill Mobile, Ala. There was in 1940 considerable expansion of existi mill properties.

Table I.—*World's Wood Pulp Balance Sheet*
1938 Estimated—Short Tons

	Consumption	Imports	Production	Exports
United States	7,546	1,711	5,975	140
Canada	3,085	17	3,622	544
Germany	2,805	172	2,715	82
Great Britain	..	1,812	218	..
Japan	1,101	161	940	0
France	806	436	375	5
Sweden	..	..	3,384	2,185
Russia	1,070	0	1,070	0
Finland	1,099	0	2,472	1,373
Norway	427	17	976	566
Italy	522	294	228	..
Others	1,278	638	784	187

Note: Since all data for 1938 are not available, the following figures for 1937 are helpf Great Britain—consumption 2,223, exports 10; Sweden—consumption 1,082, imports 1 Italy—exports 0.

Table II.—*United States Paper Production*
In Short Tons (U.S. Census)

	1936	1937	1938	1939
Newsprint and similar papers	938,287	975,854	1,090,000	954,259
Book papers and coating raw-stock	1,438,046	1,520,523	1,424,000	1,515,190
Paperboard	5,454,637	5,802,036	5,137,000	6,104,968
Wrapping	1,879,323	2,053,387	1,897,000	2,238,993
Writing	603,853	578,147	510,000	594,594
Cover	24,000	24,437	21,500	19,401
Tissue	494,721	546,152	500,000	655,723
Building	549,701	608,086	568,000	645,924
All other, including absorbent	238,117	196,317	180,000	704,422
Total—all grades	11,620,685	12,304,939	11,327,500	13,493,476

Table III.—*United States Production and Consumption of Paper, Wood Pulp, and Pulpwood (Estimated)*

	Paper Tons		Wood Pulp Tons		Consumption of Pulpwood (Cords)		
	Production	Consumption	Production	Consumption	Domestic	Imported	Total
1934	9,186,266	11,185,682	4,425,669	5,969,633	5,979,700	817,000	6,796,700
1935	10,506,195	12,490,886	4,944,226	6,877,869	6,590,942	1,037,332	7,628,274
1936	11,670,000	14,546,046	5,695,219	7,120,829	7,506,156	1,209,760	8,715,916
1937	12,837,003	16,055,681	6,573,918	8,692,489	8,377,132	1,522,868	9,900,000
1938	12,860,000	16,000,000	5,934,000	7,5 6,000	8,194,000	1,030,000	9,224,000
1939	13,493,476	16,000,000	7,117,000	9,003,937	..	..	..

Canada.—Business conditions in Canada reflected world con-ons and in particular those of the United States, where so much sprint is sold. Business started in 1939 under strong condi-s and has been improving. Although prices were increased, se were offset considerably by the rising costs of raw mate-s, etc. Board mills had an excellent year, particularly con-ers for the retail trade.

There was no new mill construction during 1940. There was, ever, some expansion in existing mills.

One-sixth of the value of the gross exports from Canada is resented in pulp and paper.

United Kingdom.—The paper business in 1940 in the United gdom felt the effects of war, and production was drastically tailed by government decree. To meet the demand for raw terials to replace wood pulp and esparto, intensive efforts e being made to gather as much waste paper as possible for se in making papers, largely for government use.

Although no official statistics have been issued since 1935 by board of trade, those in Table IV for 1938 and probably for 9 (in long tons) are about correct in so far as the use of

Table IV.—*Raw Materials in Paper Production, Great Britain*

Material in Long Tons	Paper	Board
leached sulphite	117,000	18,000
nbleached sulphite	555,000	25,000
lphate	212,000	38,000
echanical	703,000	47,000
notter	3,000	17,000
sparto	130,000	..
ags, etc.	50,000	..
aste paper	10,000	290,000
oading, etc.	220,000	15,000
	2,000,000	450,000

v materials is concerned. It is difficult to estimate the effect European war conditions, since some mills were turned over munitions manufacture. There was probably a considerable rease in 1940 in paper imports to offset this temporary de-ase in production.

The total paper and board produced in 1939 was 2,306,452 long s.

The total consumed was 3,200,000 tons. (R. G. M.)

pua: *see* British Empire; Pacific Islands, British.

raguay, an inland republic in southern South America; language, Spanish; capital, Asunción; provisional sident, General Higinio Moríñigo. The area is 154,165 sq.mi. e population (1936 census: 936,126) was officially estimated at 4,848 on Dec. 31, 1938. The chief cities are: Asunción, 104,-0; Villarrica, 20,000 (est.); Concepción, 11,000 (est.); En-nación, 10,000 (est.); Paraguarí, 10,000 (est.).

History.—The year 1940 was one of economic and political dif-lties for Paraguay. By Jan. 1940, the "honeymoon period" which l followed the accession of President General José Félix Estig-ibia in Aug. 1939 had spent its course. Bitter interfactional itical dissensions and excessive agitation by university students culminated in a cabinet crisis in mid-February. On Feb. 18, President Estigarribia proclaimed a political truce and assumed dictatorial powers as the only alternative to political anarchy, pending the drafting of a new constitution to replace that of 1870. Estigarribia, who was generally regarded as a vigorous and capable statesman devoid of personal ambition, was able to maintain a strong government and to enhance its prestige among the American republics. Construction of public works, notably the Asunción-Villarrica highway, was pushed, as technical experts from the United States studied possibilities of economic reform and expansion. At the Havana conference in July, Foreign Minister Salomoni gave stanch support to the move for western hemisphere solidarity (see Hispanic America and the European War). Meanwhile, a special committee of law professors drafted a new constitution, which was completed in July. The document followed the general lines of its predecessor, but reflected the president's own social consciousness. Submitted to a national plebiscite on Aug. 4, it was given overwhelming popular approval. President Estigarribia thereupon announced new presidential elections to be held in November. The death of President Estigarribia in an aeroplane crash on Sept. 7 threw the entire country into confusion. The cabinet selected General Higinio Moríñigo, minister of war, as provisional president until the new elections could be held, but the new president, reputedly under strong army influences, soon postponed the election until 1943. Various Estigarribia reforms were discarded or shelved, and over the ensuing three months all members of the Estigarribia cabinet gave up their posts as political friction grew.

Education.—Paraguay has over 1,800 schools, with enrolment of over 150,000. The National University of Paraguay is at Asunción.

Finance.—The monetary units are the paper and gold pesos, both based on Argentine currency (values: approximately $\frac{1}{3}$ cent and 68 cents U.S.).

Trade and Communication.—External communication is primarily by way of the Paraná river, where regular, frequent steamer service is maintained; by railway to Argentina; and Pan American Airways to Argentina and Brazil. There are 1,147 km. of railways. The highway system is in process of development. Efforts to break Argentine control over the country's trade outlets have been manifested in plans for highway and railway connections with the south Brazilian coast. The 220-km. Marshal Estigarribia highway between Asunción and Villarrica, now under construction by a North American corporation and financed through credits granted by the United States Export and Import bank in 1939, it is intended, will ultimately be extended to the Brazilian border. Completion is planned for 1942 or early 1943.

Imports (chiefly foodstuffs, textiles and machinery) totalled 12,603,834 gold pesos in 1939. Nearly 40% came from Argentina, the balance largely from Germany, Great Britain and the United States. Exports were 13,163,516 gold pesos, and comprised quebracho extract, canned meat, hides, yerba maté, meat extract and cotton. In the first nine months of 1940 imports increased sharply, but the problem of marketing export commodities formerly taken by war-involved countries of continental Europe became increasingly difficult.

Resources.—Paraguay's resources are agricultural, pastoral and forestal. Cotton, maté (Paraguay tea), tobacco, sugar and citrus fruits are the leading agricultural commodities. Cattle are the principal livestock. Quebracho and its extract (tannin) are the

most important forest products. Manufacturing is on a small scale and for domestic consumption, except for processed meats and some fine lace work for export.

Defence.—In 1939 Paraguay's defence forces included an army of some 10,000 men, and a navy of two gunboats. (L. W. Be.)

Parapsychology: *see* Psychical Research.

Parents and Teachers, National Congress of.

The National Congress of Parents and Teachers, represented locally by parent-teacher associations, was established in Washington, D.C., Feb. 17, 1897, as the National Congress of Mothers. The membership, however, for many years has included fathers, teachers and other citizens. On April 15, 1940, there were 2,379,599 active members enrolled in 28,000 associations in the 48 states, the District of Columbia, Hawaii, Alaska and Puerto Rico.

Congress parent-teacher associations have for their purpose the education and welfare of children and youth. Activities vary with the type of school with which the parent-teacher associations are connected, the educational system under which the school operates, the customs of the members of the group and the social and economic life of the community. The activities relate to art, character and spiritual education, health and summer round-up of the children, citizenship, the exceptional child, education for home and family life, international relations, juvenile protection, legislation, mental hygiene, motion pictures and visual education, music, parent education, radio, reading and library service, recreation, rural service, safety, school education, social hygiene, and study of the effects of alcohol and narcotics. The program of action for 1940–43 has for its basis the theme, "The Child in His Community."

The *National Parent-Teacher* is the official parent-teacher magazine, issued ten times a year. The *National Congress Bulletin* is sent monthly from September to June to every local association. Among the many publications are the annual convention *Proceedings* and *Schools for Democracy*. The office of the National Congress is at 600 South Michigan boulevard, Chicago, Ill.

Paris. Paris, capital of France (population 2,829,746; of Greater Paris, including neighbouring suburban area, 4,933,855), is both the administrative and cultural centre of France and an important industrial region, as the residential part of the city is surrounded by a belt of predominantly industrial suburbs. For the first time since the Franco-Prussian War of 1870–71, Paris in 1940 experienced a hostile occupation when the German forces entered the city early on the morning of June 14. It was the ninth recorded invasion of Paris. The capital previously had been declared an open city and was surrendered without fighting, following the collapse of the French effort to hold the river lines of the Somme and the Marne during the previous week.

There was an enormous flight of the population from Paris in trains, automobiles, trucks, peasant carts, on bicycles and on foot during the last days before the fall of the city and it was estimated that only about one-third of the population remained when the Germans entered. After the signing of the armistice there was a steady filtering back of residents to the city. It was reckoned that the population at the end of August was 1,300,000 below the normal figure. Jean Chiappe, former conservative prefect of the police, was appointed civil governor of the city after the German occupation; final decisions rested in the hands of the German military authorities. Chiappe was subsequently transferred to the post of high commissioner for Syria and was killed in an aeroplane accident in the Mediterranean.

German soldiers were not much in evidence in Paris after the occupation, being mostly quartered outside the capital. Groups of soldiers were taken in buses and trucks on sightseeing trips to the city's many places of historical and artistic interest. The city suffered considerable physical deprivations as a result of the foreign occupation and the blockade. Rations in occupied France at the end of October were reported to be $\frac{3}{4}$ lb. of meat, $5\frac{1}{2}$ lb. of bread, $3\frac{1}{2}$ oz. of butter and $1\frac{3}{4}$ oz. of cheese per week, and there was a good deal of standing in line for provisions. There was also a shortage of fuel. On Sept. 9, 1940, the president of the Union of Mayors of the Seine district stated that there were 300,000 unemployed in the region of Paris.

The discipline of the German troops, according to general testimony, was good and no cases of disorderly pillage were reported, although there was some confiscation of goods in Jewish shops. There were occasional minor incidents, as when the German military authorities threatened to close the moving picture theatres unless applause at bombing of German towns by the British air force ceased and when student demonstrations occurred on Armistice day, with the result that the police intervened and four demonstrators were injured. As a reprisal there was a temporary closing of the higher schools. The opera and theatre resumed

GERMAN CAVALRY entering Paris June 14, 1940 skirted the Arc de Triomphe, under which the tomb of the unknown soldier of 1914-18 lies

ir functions and some newspapers recommenced publication in :is. Motor transportation almost completely ceased, except for rman military cars and buses, because of the acute shortage of oline; and the "Metro" or subway became the chief means of nsportation in the city.

During the first months of the year, before the German inva- n in May and June, Paris led an easy life, for a wartime capital. few rationing restrictions, designed to limit consumption of at, pastry and alcoholic drinks, were imposed; but there was serious shortage of any foodstuffs or commodities. During winter and early spring, when the war was a matter of minor rmishes and patrol activities, many of the women and chil- n who had been evacuated from Paris in the first days of the r returned to their homes. The black-out was very mildly en- ced in Paris, by comparison with London and Berlin. "Abris" shelters were provided in the more stoutly built cellars the city and in some subway stations, and people were sup- ed to take refuge there on the sounding of the air-raid alarms, which there were a fair number. The only air attack on the y, however, occurred on June 3 when some 200 German aero- nes dropped about 1,000 explosive and incendiary bombs on :is and its environs, killing 254 persons and wounding 652. e objectives of this German raid were primarily industrial nts and more damage was inflicted on the suburbs of the city n on Paris itself.

The terms of the armistice contemplated a possible return of French government to Paris before the end of the war; and s subject was in 1940 under discussion between the Vichy gov- ment and the German authorities. Marshal Pétain was espe- lly anxious to transfer the seat of government to Paris, which he historic capital of the country. Negotiations on this ques- n advanced far enough in 1940 to permit some preparation of rsailles as the seat of the French government, which would ap- rently enjoy an extraterritorial status in the German-occupied a, with some kind of facilities for unobstructed communica- n with the unoccupied provinces. No definite decision had been en, however, by the end of the year. (W. H. CH.)

rks and Monuments: *see* NATIONAL PARKS AND MONU- NTS.

rliament, Houses of. The 1940 session of the British parliament was opened by the g on Nov. 28, 1939, and was prorogued on Nov. 21, 1940.

House of Commons.—There was the unprecedented number of by-elections during the eleven months Jan.–Nov. 1940, with e others pending and one or two other constituencies virtu- y unrepresented, the members having been reported as "miss- " or prisoners of war; over 100 members were with the armed ces.

No change in the representation of parties occurred; but the rty truce was ignored on 13 occasions, on 8 of which the com- nist, fascist or "anti-war" candidate forfeited his deposit of 50 by failing to secure one-eighth of the total poll. The return the house of Sir Edward Cadogan, a member of the India atutory commission 1927–30, and the accession to it of the me minister's son, Randolph Churchill, should be recorded.

Holidays were short, and, though the house of commons as a e met three times a week only, the various committees were ly occupied. Winston Churchill succeeded Neville Chamberlain prime minister on May 10, and on May 18 announced that he uld lead the house as far as his duties would permit and that lord privy seal, C. R. Attlee, would act as deputy leader; a v days later he stated that as no alternative party capable of ming a government existed, the salary of the leader of the opposition would be held in abeyance. Secret sessions of both houses were held from time to time to discuss matters arising out of the war, and on Oct. 24 a bill prolonging the life of this parliament for a year from Nov. 25—when it would normally lapse—was passed. A move was also made toward the setting up of a speaker's conference to consider proposals for electoral reform.

Suggestions for the broadcasting of the prime minister's speeches from the house and for the issue of *Hansard* in a cheap and, perhaps, condensed form were not favourably received; but with regard to the latter, permission was later obtained by a publisher to issue abbreviated, though verbatim, versions of the parliamentary debates, and two volumes dealing with the period from Aug. 24, 1939, appeared at 6*d.* each.

A question of privilege arose through the detention in May of Captain Ramsay (member for Peebles) under Defence Regulation 18B, which gives the home secretary this power if he has reasonable cause to believe any person to be of hostile associations or recently concerned in acts prejudicial to public safety. Captain Ramsay's appeal, on the ground of privilege, was dismissed in November, it being found that his detention was not due to anything he had said in parliament. Another matter affecting members was the appointment in October of a select committee of all political parties to inquire into the conduct of Mr. Boothby (Aberdeen, E.), parliamentary secretary to the minister of food, in connection with the payment from assets in Great Britain of claims against the government of and institutions in Czechoslovakia. Mr. Boothby had been active as chairman of a committee dealing with this matter and, said Mr. Churchill, appeared to have had a financial interest in one large claim.

House of Lords.—The composition of the house of lords remained practically unchanged; six baronies and one viscountcy became extinct during the session, and seven baronies and two viscountcies were created, one of the new viscounts (Hewart) having formerly sat as a baron. Lord Caldecote, the then secretary for the dominions, became leader of the house on the change of government in May and, on becoming lord chief justice on Oct. 3, was succeeded by Lord Halifax, secretary for foreign affairs. Lord Addison was in 1940 leader of the Labour peers. (L. H. D.)

Pasternack, Josef Alexander (1880–1940), Polish-American orchestra conductor, was born in Czestochowa, Poland, the son of the conductor of the town band. He began to play the violin at the age of four and at ten he was sent to the Warsaw conservatory of music, where he learned to play every musical instrument except the harp. He went to the United States on a concert tour when a young man and remained as solo viola player in the orchestra of the Metropolitan Opera company of New York. At the suggestion of Toscanini he became a conductor, and through the influence of Karl Muck he was engaged as conductor of the Bremen orchestra. He was called back to the United States to conduct the orchestra of the Metropolitan Opera company. For five years he also conducted the Philadelphia Philharmonic orchestra. In 1916 he became the musical director of the Victor Talking Machine company. In later years he conducted radio programs. He died in Chicago, April 29.

Patents. The year 1940 marked the sesquicentennial of the signing of the first United States patent law by President George Washington on April 10, 1790. President Roosevelt by proclamation designated April 10, 1940, as "Inventors and Patent day" to commemorate an event which, he declared, "had proved so important and salutary to this nation." By joint resolution of both houses of congress, a commission to mark the anniversary by appropriate exercises was authorized and private

organizations also participated in the celebration.

Several of the acts of congress respecting patents which were enacted in 1939 came into force in 1940. Most important of these is the act reducing from two years to one year the period of publication and public use which bars the grant of a patent. In most foreign countries the publication or use of an invention at any time prior to applying for a patent will bar the grant of a valid patent.

Another act of congress, effective on June 30, 1940, transferred from the patent office to the register of copyrights in the Library of Congress, jurisdiction over the registration of copyrights for prints and labels used for articles of merchandise. In 1874 congress assigned to the patent office the function of registering such copyrights, although all other copyrights were registered in the Library of Congress.

A measure approved July 2, 1940, amended the Tariff act to provide that the importation of products made by processes covered by U.S. patents may be stopped under certain circumstances.

As a part of the program of national defence congress provided, on July 1, 1940, that the commissioner of patents could order held in secrecy inventions relating to the public safety and defence and withhold the granting of a patent when the publication or disclosure of the invention might be considered detrimental.

Among the effects of the war in Europe was a decline in the number of applications received from the belligerent and other countries.

Applications filed were 61,425 in 1940, as against 66,166 in the preceding year. Patents granted, including those covering reissues, designs and plans, numbered 47,924, exceeding by 451 the total issued in 1939. Registrations of trade marks, including petitions for renewals, were 14,843, an increase of 524 compared with 1939. Earnings represented by initial fees paid by applicants were $1,838,730 in 1940. This was $141,840 below the total for 1939. Receipts from all sources in 1940 were $4,563,916.32, or $99,623.10 less than expenditures. This was the second deficit since 1933. During that period, however, the surpluses averaged $102,100.70.

(C. P. Co.)

Patrick, Mary Mills (1850–1940), U.S. educator, founder and president emeritus of the Istanbul Woman's college in Turkey, was born in Canterbury, N.H., March 10. She was educated at Lyons college in Iowa and at Heidelberg, Zürich, Leipzig and Berne. In 1871 she was appointed as a teacher in the American school in Erzerum, Armenia. Then, after teaching a while at the Home school at Scutari, she became its head in 1883. Through her efforts it received a charter as the American College for Girls in Constantinople and in 1894 its value was recognized by the Turkish authorities and its permanence was assured. She received the degree of doctor of laws from Smith college and was decorated by the sultan of Turkey and the king of Bulgaria. She retired in 1924, returned to the United States and died in Palo Alto, Calif., Feb. 25.

Peaches. The United States peach crop in 1940 was estimated in October by the department of agriculture as 52,516,000 bu. The 1939 crop was 60,822,000 bu. and the ten-year average (1929–38) was 52,713,000 bu. California clingstone production in 1940 was estimated at 14,084,000 bu., compared with

Peach Production by States, 1939 and 1940

State	1940 bu.	1939 bu.	State	1940 bu.	1939 bu.
California	22,335,000	24,043,000	Delaware	437,000	422,000
Georgia	4,154,000	3,800,000	Oklahoma	434,000	615,000
Pennsylvania	2,356,000	2,460,000	Mississippi	420,000	1,034,000
Arkansas	2,040,000	2,615,000	Oregon	352,000	391,000
Texas	2,036,000	1,972,000	Tennessee	264,000	1,470,000
Colorado	2,000,000	1,575,000	Kentucky	258,000	562,000
South Carolina	1,742,000	1,636,000	Illinois	255,000	1,800,000
Michigan	1,682,000	2,760,000	Idaho	207,000	136,000
New Jersey	1,494,000	1,435,000	Kansas	183,000	154,000
Washington	1,494,000	1,210,000	Connecticut	130,000	84,000
Virginia	1,392,000	1,025,000	New Mexico	120,000	73,000
New York	1,380,000	1,722,000	Iowa	93,000	110,000
North Carolina	1,344,000	1,305,000	Massachusetts	76,000	74,000
Alabama	700,000	1,705,000	Florida	66,000	33,000
Utah	574,000	564,000	Nebraska	58,000	70,000
Missouri	528,000	1,140,000	Indiana	58,000	378,000
West Virginia	446,000	315,000	Arizona	50,000	51,000
Ohio	443,000	1,212,000	Rhode Island	18,000	12,000
Louisiana	442,000	409,000	New Hampshire	10,000	17,000
Maryland	440,000	427,000	Nevada	5,000	6,000

15,251,000 bu. in 1939; freestones 8,251,000 bu. in 1940 and 8,792,000 bu. in 1939. The table shows estimated production, all varieties, by states in 1940 and 1939. (S. O. R.)

Peanuts. A record high acreage in principal peanut-growing states and favourable growing weather raised the 1940 peanut crop in the United States 30% above 1939. October estimates by the department of agriculture placed peanut production for picking and threshing in 1940 at 1,539,540,000 lb., a

U.S. Peanut Production (Picked and Threshed), 1940 and 1939

	1940 lb.	1939 lb.		1940 lb.	1939 lb.
Georgia	536,000,000	341,250,000	Oklahoma	30,550,000	15,600,000
North Carolina	298,125,000	290,700,000	South Carolina	15,000,000	11,840,000
Alabama	205,800,000	128,250,000	Arkansas	13,250,000	10,200,000
Virginia	185,900,000	189,175,000	Louisiana	6,305,000	6,110,000
Texas	166,950,000	129,480,000	Tennessee	5,840,000	6,000,000
Florida	61,100,000	37,400,000			

against 1,179,505,000 lb. in 1939 and a ten-year (1929–38) average of 1,035,243,000 lb. Yield per acre in 1940 was 787·5 lb. compared to 634·5 lb. in 1939 and a ten-year average of 721·4 lb.

(S. O. R.)

Pearl, Raymond (1879–1940), U.S. biologist, was born in Farmington, N.H., June 3, and died in Hershey, Pa., Nov. 17. For a biographical sketch see *Encyclopædia Britannica,* vol. 17, p. 420.

Pears. The 1940 pear crop in the United States was estimated in October by the department of agriculture as 32,114,000 bu., all varieties. This is 3·4% larger than the 1939 crop of 31,407,000 bu. and 22% above the ten-year (1929–38) average of 26,333,000 bu. Total production of Bartlett pears in California

Pear Production by States, 1939 and 1940

State	1940 bu.	1939 bu.	State	1940 bu.	1939 bu.
California	9,667,000	10,542,000	Florida	180,000	69,000
Washington	6,557,000	5,779,000	Tennessee	171,000	244,000
Oregon	4,476,000	4,229,000	Iowa	146,000	139,000
New York	1,802,000	1,749,000	South Carolina	123,000	104,000
Michigan	1,398,000	1,354,000	Utah	120,000	104,000
Pennsylvania	873,000	918,000	Maryland	104,000	81,000
Ohio	756,000	956,000	West Virginia	90,000	56,000
Illinois	581,000	668,000	Oklahoma	73,000	92,000
Texas	545,000	406,000	Idaho	66,000	62,000
Missouri	476,000	426,000	New Jersey	63,000	52,000
Virginia	525,000	189,000	New Mexico	62,000	45,000
Mississippi	438,000	348,000	Nebraska	60,000	55,000
Indiana	435,000	527,000	Massachusetts	51,000	53,000
Georgia	397,000	281,000	Connecticut	43,000	43,000
Kentucky	332,000	206,000	New Hampshire	15,000	11,000
North Carolina	307,000	230,000	Maine	13,000	13,000
Alabama	292,000	313,000	Delaware	12,000	9,000
Colorado	255,000	173,000	Rhode Island	9,000	8,000
Kansas	223,000	151,000	Arizona	7,000	11,000
Louisiana	214,000	130,000	Vermont	6,000	7,000
Arkansas	204,000	211,000	Nevada	3,000	3,000

Washington and Oregon in 1940 was 14,096,000 bu., other varieties 6,604,000 bu., compared to 14,529,000 bu. Bartletts and 6,021,000 bu. of other varieties in 1939. In New York, Bartletts and Clapp's Favorite produced heavier yields than in 1939, while Bosc and Kieffers were about the same as in 1939, with Seckel pears in a lighter 1940 crop. The table shows the estimated production of pears by states in 1940 and 1939. (S. O. R.)

Pecans: *see* NUTS.

Peixotto, Ernest Clifford (1869–1940), U.S. artist, was born in San Francisco, Oct. 15, and received his art education in Paris under Benjamin Constant and Jules Lefebvre. He won a reputation as a mural painter and in 1911 was commissioned to paint the story of "La Mort d'Arthur" for the public library in Cleveland, Ohio. The successful accomplishment of the task led to commissions to decorate the walls of public rooms in New York city and Paris. In 1918 he went to France as official artist with the American expeditionary force. The next year he became director of the

partment of mural painting in the Beaux Arts Institute of Design in New York city, holding the post until 1926 when he resigned to devote his time to painting and writing. He was an officer of the French Legion of Honour and president of the National Society of Mural Painters. He died in New York city, Dec. 6.

Pellagra. Striking advances in the therapy for dietary deficiency diseases were made in 1940. What had once been under the name of pellagra is now known as a mixture of diseases, though to persons in the endemic areas pellagra still connotes a picture of prolonged agony, years of ill health and lingering death, often associated with confusion or insanity.

The mortality rate for severe pellagra a few years ago was over 50%, but thousands of consecutive cases have been treated without a death.

Case studies of persons with dietary deficiency diseases, analysis of their diets and controlled observations on the response of these people to synthetic chemical substances, such as nicotinic acid, thiamin, riboflavin, pyridoxine and ascorbic acid, etc., indicate that deficiency diseases are mixed in nature and occur simultaneously; that is to say, if one has pellagra, he may well be expected to have "a touch of" thiamin deficiency and riboflavin deficiency.

Persons committed to custodial institutions for the insane because of pellagrous psychoses have been restored to normal mental health by the administration of adequate amounts of nicotinic acid or substances that act similarly.

It has been shown that what was termed the "initial nervous syndrome of pellagra," characterized by apprehension, irritability, disorders of heart action and digestion, tremors, shuddering, imaginary fears, such as of snakes, fire or death, can be relieved by thiamin.

Many of these people who had disintegration of personality and a breakdown in morale have been restored to good health; some have returned to hard work and others have been accepted in the army and navy.

A new dietary deficiency disease in children has been discovered which prevents them from developing properly in weight and height, retards their progress in school and causes eye disease and soreness at the corners of the mouth. When such symptoms arise from the lack of riboflavin in the diet, they are relieved by the administration of riboflavin or substances rich in it.

From a practical point of view, it is important to realize that even when specific therapeutic agents are administered in the treatment of deficiency diseases to persons of any age, they should also be given a well balanced high caloric diet. (*See* also DIETETICS; VITAMINS.)

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(T. D. S.)

Pemba: *see* BRITISH EAST AFRICA.

Pennsylvania, one of the original 13 states of the United States, popularly known as the "Keystone State," area 45,126 sq.mi. (239 sq.mi. water); population (U.S. Census, 1940) 9,900,180. Capital, Harrisburg, 83,893.

Cities with a larger population (census of 1940) were Philadelphia, 1,931,334; Pittsburgh, 671,659; Scranton, 140,404; Erie, 116,955; Reading, 110,568; Allentown, 96,904; Wilkes-Barre, 86,236. There were gains in population in 56 of the 67 counties, and in the cities of Harrisburg, Erie and Allentown.

History.—The Democrats carried the state in the election on Nov. 5, giving to President Roosevelt its 36 electoral votes. Roosevelt received 2,171,035 votes in the balloting and Willkie 1,889,848. Joseph F. Guffey was re-elected to the United States senate and 19 Democrats were elected to the national house of representatives, a gain of four since 1928. The Republicans elected 15. The Democrats elected G. Harold Wagner as state treasurer and F. Clair Ross as auditor general. The Republicans retained control of the state senate with 32 members to 18 Democrats, but the Democrats elected 126 members of the house of representatives to 82 by the Republicans, giving the Democrats control of that body. The question whether motion picture theatres should be operated on Sunday was submitted to the voters and 87 communities voted against Sunday opening; 47 in which the theatres had been closed voted to permit their operation; 12 which five years ago had voted for Sunday opening favoured its continuance and six in which the theatres had been open voted to close them this year.

The general assembly, at the call of the governor, met in special session on May 6, primarily to appropriate $71,850,000 for unemployment relief. The money was voted. Among other measures approved were one authorizing the extension of the Harrisburg-Pittsburgh superhighway from Carlisle to Philadelphia; another appropriating $1,000,000 for the relief of distressed school districts; an increase from 16 to 18 years in the age limit for those eligible for aid as dependent children; an amendment to the election code permitting a special election for filling vacancies in the general assembly during a recess, and one exempting employers from the payment of insurance taxes on salaries in excess of $3,000. The head of the new department of commerce reported early in 1940 that $194,846,109 had been spent for new industrial plant construction and equipment in 1939. The dispute over the constitutionality of the Fair Sales act of 1937 reached the state supreme court in May. That court decided that the act was invalid as its second section, which forbids the sale of merchandise at less than cost by any retailer or wholesaler, violated the 14th amendment of the United States constitution. The court pointed out that the Pennsylvania act differed from similar acts in other states as it absolutely forbade the sale of any article below cost, whereas the acts of other states forbade such sale only when made for the purpose of injuring competitors or creating a monopoly. In January the governor appointed an anthracite emergency committee to attempt to solve the problems of the mining industry. The committee is made up of three state officers and representatives of the United Mine Workers and the companies which operate the mines. It agreed on a voluntary stabilizing program under which the amount of anthracite to be mined by each operator would be allocated from week to week. David L. Lawrence, former secretary of the commonwealth, who was indicted in 1939 for conspiracy, blackmail and violation of the election laws, was brought to trial and acquitted. The governor called on the people of the state to observe Nov. 28 as Thanksgiving day.

The principal officers were: governor, Arthur H. James; lieutenant governor, Samuel S. Lewis; attorney-general, Claude F. Reno; treasurer, F. Clair Ross, until May 31, 1941, when he will be succeeded by G. Harold Wagner; superintendent of public instruction, Francis B. Haas; chief justice, William I. Schaffer.

Education.—The school system of the state is under the direction of the department of public instruction. It has carried out

successfully its plan to reduce the number of one-room school houses by the consolidation of schools. The department examines and licenses applicants for permission to practise various professions, including architects, anthracite and bituminous mine inspectors, dentists, engineers, nurses, opticians, physicians, pharmacists and public accountants. The state appropriates each year large sums for the relief of rural schools. It also appropriates money to the University of Pennsylvania, the University of Pittsburgh, Temple university, Jefferson and Hahnemann Medical colleges and the Woman's Medical college.

Banking and Finance.—On June 30, 1940, there were 402 financial institutions under the supervision of the department of banking, exclusive of 143 national banks with trust departments. The total resources of the state institutions on that date were $3,181,680,536.30. The capital of the 402 banks was $112,853,477.72 in common stock and $19,124,369.67 in preferred stock. There were 3,794,273 depositors. The state institutions administered trust funds on March 4, 1940 amounting to $4,596,618,258.41.

On June 29, 1940 there were 690 national banks with a total capital of $165,433,000, deposits of $3,142,952,000 and assets of $3,608,471,000.

Agriculture, Manufactures, Mineral Production.—According to the latest agricultural statistics there were in the state 191,284 farms with a total acreage of 15,855,343. The value of the land and buildings was $861,706,599. The value of the livestock on Jan. 1, 1940 was $140,587,000. The value of the field crops for 1939 was $140,450,000 and the cash income from livestock and livestock products was $189,169,000. The latest industrial statistics show that there were in the state 17,287 establishments with an invested capital of $4,283,239,700, employing 1,096,646 persons to whom $1,125,630,000 was paid in wages. In addition there were 156,460 persons on salary, including officers and office employees to whom $354,271,500 was paid. The value of the output was $4,342,495,200.

The metal and mineral products were valued at $3,058,279,700; food and kindred products, $770,319,200; mine and quarry products, $446,197,300; textiles, $819,402,500; paper and printing industries, $340,436,600; tobacco and its products, $35,513,300.

Highways.—On May 31, 1940, there were 95,321 mi. of highways, 40,521 mi. of which were classed as state and rural roads. There were 32,142 mi. of roads improved with concrete, macadam or brick surface and 8,379 mi. of unimproved roads. The receipts of the road fund for the year ending May 31, 1940, were from the gasoline tax, $35,636,693.07; from motor vehicle registration, $30,352,938.04; from operators' licences, $3,299,879.50, and from federal aid, $7,149,078.67. During the year the highway department spent from this fund $53,102,272.67. On Oct. 1, 1940 the Pittsburgh-Harrisburg super-highway was opened. (*See* ROADS AND HIGHWAYS.) (G. W. Do.)

Pennsylvania, University of, opened its 1940–41 session with an enrolment of approximately 15,447 and a faculty of approximately 1,620. Dr. William E. Lingelbach, professor of modern European history, became dean of the college, vice Dr. Paul H. Musser, who had become administrative vice-president.

Dr. Herbert F. Goodrich, vice-president in charge of the law school, dean of the law school and professor of law, resigned to accept appointment by the president of the United States as judge of the third circuit court. Dr. Edwin R. Keedy, professor of law, became acting dean of the law school. John B. Thayer, trustee of the university and director of the bicentennial celebration, became treasurer of the university, vice F. Corlies Morgan, deceased.

During the year 1940, the university celebrated its bicentennial. Representatives of 416 universities, colleges and learned societies throughout the world attended this celebration. Scholars from the United States and foreign nations participated in 78 addresses and symposia in the fine arts, humanities, medical sciences, natural sciences, religion and social sciences, held at the university and attended by 25,700 persons. At a convocation held Sept. 20, 1940, honorary degrees were conferred upon the president of the United States and the chief justice of Canada, who made responses.

There was continued activity in research throughout the university, particularly in medical research. (T. S. G.)

Pennsylvania Turnpike: *see* PITTSBURGH; ROADS AND HIGHWAYS; TUNNELS.

Pension, Old Age: *see* RELIEF; SOCIAL SECURITY; UNITED STATES: *Social Security. See* also under various states.

Pension, Soldiers': *see* VETERANS' ADMINISTRATION.

Pepper: *see* SPICES.

Perfumes: *see* SOAP, PERFUMERY AND COSMETICS.

Perkins, James Handasyd (1876–1940), U.S. banker, was born in Milton, Mass., Jan. 11, and was graduated from Harvard university in 1898. From 1905 to 1914 he was in the banking business in Boston, Mass. and Albany, N.Y. In the latter year he became vice-president of the National City bank in New York city. He was president of the Farmers Loan & Trust company for eight years; in 1929 he became chairman of the City Bank Farmers Trust company, and in 1933 chairman of the board of the National City bank. He was commissioner of the American Red Cross in Europe from 1917 to Sept. 1918, when he resigned to enlist in the American expeditionary force. He received the U.S. Distinguished Service medal and was made an officer of the French Legion of Honour and a commander of the Order of the Crown of Belgium. He died in Mount Kisco, N.Y., July 12.

Permanent Court of International Justice.

The Permanent Court of International Justice became moribund after the invasion of the Netherlands on May 10, 1940. The court held only one session during the year, from Feb. 19 to Feb. 26. In that time it ordered the oral argument in the case of the Electricity Company of Sofia (Belgium) *v.* Bulgaria. The Bulgarian government sought an extension of time because its counsel, Professor Gidel, had been mobilized in the French army. The court considered this not a case of *force majeure* and ordered the oral argument to begin May 16. Because of the war the oral argument did not take place, for the court did not convene after February.

An extension of time was granted for the submission of memorials in the Gerliczy case brought by the Principality of Liechtenstein against Hungary. The memorial was to be filed June 15, 1940, but this was not done.

During 1940, Great Britain, following the practice of several countries during 1939, gave notice of the termination of its acceptance of the court's obligatory jurisdiction under article 36 of the statute. Other countries had given notice that their acceptance was not to be operative with respect to disputes arising out of the war. On the other hand, some of the signatory governments were of the opinion that such reservations to a previous acceptance could not be made, and entered caveats or reservations of their own against the notice. The matter of obligatory jurisdiction was therefore in some confusion, which would probably not be settled unless the court was re-established and a case actually

se involving the issue. Perhaps it should be noted that in Feb. 40 the Greek government accepted the court's obligatory jurisdiction for a period of five years commencing Sept. 1939.

rsia: *see* IRAN.

ru, a republic on the west coast of South America; language, Spanish; capital, Lima; president, Dr. Manuel Prado y arteche. The area, including some 100,000 sq.mi. of territory outed with Ecuador, is officially estimated at 532,185 sq.mi. ring 1940 the first census since 1876 was taken, but no results e published by the close of the year. Meanwhile, unofficial ulation estimates ranged from 6,600,000 to as high as 10,000,-. The chief cities are: Lima, 650,000; Callao, the port of ıa, 120,000; Arequipa, 100,000; Cuzco, 80,000; Trujillo, 000; Chiclayo, 50,000; Iquitos, 40,000.

listory.—During 1940 Peru underwent a notable political readment as President Prado, who had succeeded Dictator-Presit Oscar Benavides in Dec. 1939, gradually relaxed the reints of the Benavides dictatorship and moved toward a general oration of civil liberties. Benavides himself was eliminated n the political scene with appointment as Peruvian ambassador Spain.

n May 24, the most disastrous earthquake in over half a cen- shook Lima and Callao, costing over 300 lives and doing vy property damage. Subsequently, the government announced ıs for "quakeproof" houses to replace those which had been royed.

nternationally, Peru moved generally in accord with the United es, and supported that country in its hemisphere defence proals at the Havana conference. United States efforts to obtain al base rights on the north Peruvian coast failed, however. eral popular manifestations of anti-totalitarian feeling oced in 1940, partly as a result of German pressure to ban ving of anti-nazi films. The Italian Caproni aircraft factory taken over by the government and an Italian military mission planted by one from the United States.

ducation.—Peru had in 1940 more than 5,900 elementary ols, with some 700,000 pupils, more than 216 secondary ols and several technical schools.

inance.—The monetary unit is the sol, valued at approxiely 15⅓ cents U.S. (Dec. 1940), against a 1939 average of cents.

ommunication.—Peru has good maritime and excellent air munication with foreign countries, supplemented by a railway nection with Bolivia. Air transport service links various parts he country. There were in 1940 more than 2,600 mi. of rail, including the Central Railway of Peru, which reached the est elevation of any standard gauge railroad in the world 806 ft.). As a result of the national road plan of 1937, which substantially completed in 1939 at a cost of 80,636,000 soles, Peruvian highway system embraced 16,361 mi. of which 3,293 mi. was unimproved earth and 2,315 mi. improved h. The most important developments were the Peruvian sec of the Pan-American highway, 1,895 mi. long, with 783 mi. alted, and the 190-mi. Central highway from Lima to La ced in the Amazon basin, which attains an altitude of 16,127 Due to highway improvement, gasoline consumption in 1939 12½% more than in 1938 and 22½% more than in 1937.

reign Trade.—Peru's imports are mainly machinery and cles, textiles, metals and foodstuffs. The leading exports are oleum and its derivatives (33·9% in 1939), cotton (19·7%), er (17·7%) and sugar (10·8%). In 1939 imports were 255,-376 soles (260,158,735 in 1938), chiefly from the United es, 41·1% (1938: 34·3%); Germany, 14·7% (1938: 20·3%); Great Britain, 8·4% (1938: 10·1%); and Argentina, 5·4% (1938: 6·1%). Exports were 381,421,389 soles (342,128,640 in 1938), largely to the United States, 30·4% (1938: 26·8%); Great Britain, 19·6% (1938: 20%); Chile, 7·8% (1938: 6%); Germany, 6% (1938: 10·6%); Argentina, 5·8% (1938: 7·8%); France, 5·6% (1938: 6·4%); and Brazil, 4·8% (1938: 1·9%). In the first seven months of 1940, exports rose 10% in value and imports, 33%.

Agriculture and Mining.—The chief agricultural products are cotton, sugar, rice, coffee, corn, coca and vegetable ivory. In 1939, 272,179 tons of sugar and 77,203 tons of cotton were exported. In 1939 petroleum production declined for the fourth consecutive year. Production in 1940 was estimated at 12,451,300 bbl. The principal fields are in the north, but fields were opened in the Amazon basin during 1939. Peru leads the world in vanadium and bismuth production. Copper (34,061 tons exported in 1939), silver, gold, tungsten, lead, antimony, zinc and other minerals are extensively mined. (L. W. BE.)

Pests, Agricultural: *see* ENTOMOLOGY.

Pétain, Henri Philippe (1856–), French soldier and statesman. See *Encyclopædia Britannica,* vol. 17, pp. 639–40 for his biography. The venerable marshal was called from virtual retirement in 1939 to become French ambassador to Spain after Franco's triumph in the civil war. He remained in this post after the beginning of war in 1939 until May 18, 1940 when, with France's army falling back in a retreat approaching a rout, he was summoned to Paris to act as vice-president of the government council and adviser to the minister of war. On June 16 he succeeded Paul Reynaud as premier, and the next day he was forced to sue for an honourable peace. With an energy that belied his 84 years he then began the painful task of reconstruction under the watchful eye of France's conquerors. Moving his government to Vichy July 2, he secured from the national assembly authorization to prepare a new constitution. This task he allotted to Pierre Laval, whom he named as his successor July 12 (but dropped from the cabinet Dec. 13 "for high reasons of internal policy"). On July 10 Pétain assumed dictatorial powers until such time as the new constitution was ratified. He had to face not only internal unrest but the external pressures of axis domination, Japanese aggressions in Indo-China, and the "Free French" movement of de Gaulle. His meeting with Hitler at Montoire Oct. 24 gave promise of a *modus vivendi* with Germany, but this promise was short-lived and was ruptured by the expulsion of Frenchmen from Lorraine in November—an act which Pétain vigorously protested.

Petrol: *see* GASOLINE; PETROLEUM.

Petroleum. With the war in Europe well advanced into its second year, the matter of oil supply for mechanized land, sea and air armaments and for the industrial front behind the lines was one of increasing concern to all belligerents in 1940. With blockades in force which cut off or reduced usual supplies going to many non-belligerent as well as belligerent countries, radical changes in what was once the normal movement of the world's oil were necessary.

With the United States, producing more than 60% of the world's petroleum, launched on a huge national defence program which, as it progressed, would create a new great oil demand for mechanized defence forces, further drastic adjustment was anticipated for 1941.

Up to the close of 1940, none of the major belligerents lacked oil for carrying on the war.

Since the war started, in 1939, Germany acquired either by military conquest or by diplomatic force, control of the oil-producing fields of Czechoslovakia, France, Poland and Rumania, whose annual production runs around 54,000,000 bbl. Added to this were about 4,500,000 bbl. produced in Germany and Austria. Out of the roughly 60,000,000 bbl. annually thus controlled, more than 48,000,000 bbl. were accounted for by Rumania. So far as petroleum production is concerned, these 60,000,000 bbl. were all that were available in 1940 to both Germany and Italy, because of the effectiveness of the British blockade. Russia's production of over 200,000,000 bbl. annually could not be said to be available in any quantity to the axis countries because of huge domestic requirements and transportation difficulties.

As compared with petroleum sources of 60,000,000 bbl. annually under control of Germany and Italy, Britain by controlling the seas could draw on oil-producing countries in Asia alone with an annual production of close to 200,000,000 bbl.; on South America with an annual production of 245,000,000 bbl.; on Canada, Mexico and Trinidad with a combined annual production of about 60,000,000 bbl. This did not include the tremendous production of the United States which runs over 1,200,000,000 bbl. annually.

The overwhelming advantage to Britain apparent in this comparison existed in fact in her ability to run oil through the German blockade of the British Isles and to guard against incursion of these available sources by axis powers through military or diplomatic pressure. For instance, Japan, the Asiatic member of the axis, had vital American oil sources banned to her and was exerting extreme pressure on Netherlands India for increased supplies. Any extension of Japan's aggression southward would carry the threat of permanent or temporary loss of control or availability by Britain of Netherlands India's annual production of close to 60,000,000 bbl. and of Sarawak's and Brunei's annual production of over 7,000,000 bbl.

But there was another factor in addition to those mentioned, which reduced Britain's apparent advantage. When Germany entered the war she had developed and was building tremendous plants for making gasoline from coal and lignite by synthetic processes such as hydrogenation. Much of the output of these plants had been hoarded for several years to build up large reserves. In 1938 her production of synthetic gasoline was unofficially estimated at 12,750,000 bbl., a fivefold increase over 1933. One 1940 estimate stated that Germany was producing about 100,000 bbl. of gasoline per year synthetically, which indicated that her gasoline troubles could not be acute. However, there were technical considerations which somewhat changed the picture (*see* GASOLINE), besides the effectiveness of the R.A.F. bombing of Germany's hydrogenation plants.

The fall of France and the entrance of Italy into the war carried great threat to Britain's controlled or available oil sources in Iraq, Iran and Bahrein island, these places producing nearly 120,000,000 bbl. annually. Had Italy succeeded in its invasion of Greece in 1940 or made good the boast to clear the Mediterranean of the British fleet and to take the Suez canal, it might have unleashed a German offensive through the Balkans or resulted in a diplomatic bargain with Russia which might have meant the loss of these oil sources to Britain and the acquisition of them by the axis.

As it was, even before Italy entered the war, the large bulk of Britain's oil supplies that came from Iran and the Island of Bahrein and British India, as well as the East Indies, was diverted from transportation through the Suez canal and the Mediterranean and sent around the Cape of Good Hope. Britain's continued control of the Mediterranean made Iraq production available to her.

Up to the close of 1940, Britain could get all the oil needed from the above sources, by way of the Mediterranean, and continued to ship around the Cape. In addition, there was the small production in Egypt as well as the refineries on the Suez canal. Moreover, Britain's continued control of the Mediterranean precluded in 1940 the possibility of Russian oil going through that sea to the axis powers. It shut off Rumanian oil shipments through that sea. Italy, with only a negligible home oil production, with no home coal sources for building up a synthetic gasoline production and with the British blockade tightening on her shores, was and could only, in 1940, be fed by her axis partner from the Rumanian oil fields and by Danube and overland shipments.

It has been said that to an extent unparalleled in history, the war continuing through 1940 was one fought with petroleum and for petroleum. Every military and diplomatic move since the war's beginning proved this to be true. Supplying the modern military machine requires tremendous stores and supplies of gasoline, fuel oil and lubricating oil. Military consumption is voracious.

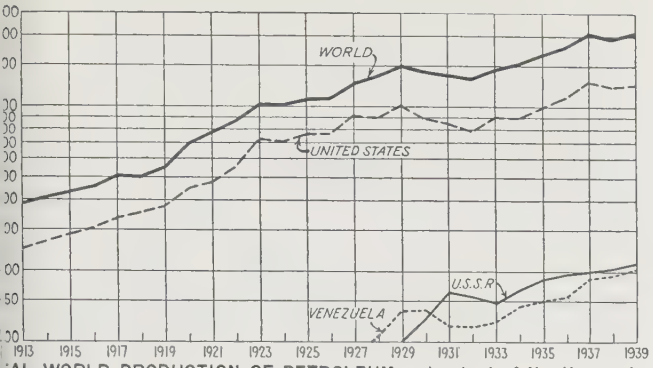
Offsetting this in part was the restriction of civilian and nonessential use of these products in all belligerent and occupied countries.

However, there is little doubt that despite Germany's hoarding of oil, despite her large production of synthetic gasoline, despite her acquisition of stocks and supplies in invaded countries and her rationing of oil products, Germany in 1940 found it vitally urgent to go into Rumania and to militarize Rumania's oil fields. This move and her strict rationing of gasoline were evidence of the shortage of petroleum among the axis powers. Lubricating oil for industrial machinery was also an acute problem. Animal and vegetable oils were pressed into service, with frequently unsatisfactory results. Oil taken from German planes was reported in 1940 to have been used far beyond what is considered safe practice in Britain and the United States. Rumanian oil has a low lubricating content, and for that reason the question of obtaining suitable lubricants continued to remain an acute one for the axis. Russian lubricants were reported to be moving up the Danube to help meet this situation.

Britain's oil picture was much better than that of the axis powers, depending upon her ability to keep open the overseas shipping lanes, and to protect her refineries and oil storage plants from destruction by German bombs. America's policy of aid to Britain gave her opportunity not alone to draw upon the tremendous oil resources of the United States but upon American tanker facilities. Many American-built tankers went over to foreign charter.

Britain's position as to home refineries and crude oil sources when the war began in Sept. 1939 was relatively one of independence even from the United States. It was better than her position when she entered the war of 1914–18, when the Allies are said to have floated to victory on a wave of American oil.

IN 1940 the Centralia-Salem oil field of Illinois was the most active producing area in the U. S. Lack of quotas and conservation laws was responsible for placing Illinois third among the oil-producing states. At the left in the picture is a small refinery; in the background is a derrick lighted for night drilling



'AL WORLD PRODUCTION OF PETROLEUM and output of the three prin- l producing countries, as compiled by *The Mineral Industry*

'hat the United States would be able to supply products of advanced nical development to Britain and still have an adequate supply to meet own increased needs for defence armaments may be illustrated by some parisons of the American oil situation in 1940 and in 1917. The ber of producing oil wells in the United States has nearly doubled. ls are drilled five times as fast. Continuous exploration is opening up fields and scientific advancement has given the means of restoring pro- tivity of old fields. Much of American oil production is held back by rating production; wells could be opened up to produce an immediate tly increased output.

'he backlog of crude oil reserves for the future is estimated to have hed a figure of 18,500,000,000 bbl.—three times greater than that of 7. American refineries operating and shut down had a capacity of 8,000 bbl. daily as of Jan. 1, 1940, or about four times the capacity 917. Stocks of essential products in 1940 were two to ten times as large n 1917, and storage capacities correspondingly greater. Land transporta- facilities were more than twice as extensive. Marine transportation pment was eight times as large. Production of finished gasoline was n times as great and production of lubricating oils doubled.

n the defence program in the United States, petroleum played an increas- y important part. Whereas during the war of 1914–18, American ex- s of petroleum products went way up, since the beginning of the war in .. 1939, they declined because of blockades and lost civilian markets. to Jan. 1, 1941, buying of petroleum products resulting from the defence gram was negligible, much less than enough to offset the loss of exports he continent of Europe. However, the program for a great mechanized y and for a two-ocean navy drawing heavily on petroleum fuels and icants created an unprecedented new consumption as it advanced.

he petroleum industry was in 1940 represented in the petroleum sec- , raw minerals division, of the advisory commission to the council national defence and in the transportation division of the national urces board. Refinery technicians have long worked closely with army navy officials in developing fuels, and a survey was under way in 1940 tudy the problems of better protection of oil storage against possible ile attack.

he American defence program might find petroleum overcoming bottle- s in fields other than oil. Great strides were made in the production of ol, commonly known as TNT, and of synthetic rubber from petroleum ces. During the war of 1914–18, toluol was an acute bottleneck in munitions industry, but petroleum chemistry's advancement has made ible the supplying by the oil industry of ample quantities to meet any rgency, it is said. Similarly, the development of synthetic rubber from oleum indicated that the United States might be made independent of ign supplies of the natural product.

IBLIOGRAPHY.—Trade Publications: *Oil and Gas Journal, National roleum News, Oil Weekly. See* also bulletins and proceedings American roleum institute. (L. M. F.)

trology: *see* GEOLOGY.

iladelphia, third largest city of the United States and first city of Pennsylvania (pop. 1,931,334, sus of 1940), like some other cities was found to have lost population since 1930, although its suburbs disclosed a gain ee times as great as its loss. There also was shown a loss of ,000,000 in the city's tax valuations; and the school popula- n dropped 6,523 from the 1939 figures. As one-sixth of the al defence work in the country was allotted to the city, the s in population was repaired, for it amounted to only about 000 persons. Efforts to improve the city government's financial ition sustained some setbacks, although the wage tax was up- d by the state courts. An attempt to finance sewage disposal a flat assessment on each property was held by the courts to a tax, and ruled unconstitutional.

The city's transportation system, which had been a problem to ckholders, underlying companies and car riders, and had been ubject of litigation from 1935 to 1939, came under new management on Jan. 1, 1940. The solution was found in the merger of the Philadelphia Rapid Transit company and its 64 underlying corporations, which had possession of the original franchises.

The new Philadelphia Transportation company, an $85,000,000 corporation, which took over the system, began a radical modernizing process immediately. Before the end of 1940, much new rolling stock on the streets, some new roadbeds, new buses had speeded up service and extended several lines. The change had been brought about with great speed, because it was only in Nov. 1939 that Federal Judge George A. Welsh had given his approval to the plan of reorganization. The city's $12,000,000 Municipal airport was opened in June, at Hog island, displacing the Camden (N.J.) airport. It was given a class-4 rating by the Civil Aeronautics authority, the highest. In June the national Republican convention was held in the Municipal auditorium, when Wendell L. Willkie was nominated for the presidency and Senator Charles L. McNary for the vice-presidency.

(J. JAC.)

Philately. The surprise of the year 1940 was the small number of stamps issued, despite the great change in governments. The bulk of stamps that did appear were from the states not engaged in war, such as the Americas. However, China brought out a new issue, purely for postal purposes. This was made necessary by the loss of her printing establishments, in occupied territory.

The year 1940 saw only 1,497 new stamps, of which 916 were purely for postal purposes, including commemoratives, and the rest mainly either air-mail or semipostal stamps, the last serving partly for postage and partly for charitable works.

The War.—Swift-moving developments robbed stamp-collecting of a promised new variety of stamp; actually in preparation was a stamp that could be used either in France or Great Britain, when the German occupation of France made it unnecessary. Such a stamp has never been issued, and it would have marked an entirely new type of issue. Elsewhere, the expected surcharges for occupied zones did not appear. Norway and Denmark still used their own stamps; Poland, for the short time it sent out mail, had its issues surcharged in the German-occupied region. Of course the Czech issues, surcharged "Böhmen und Mähren," were known before the complete subjugation. Only one Carpatho-Ukrainian stamp appeared. Slovak issues were long and, prior to the blockade, unending.

The British blockade stopped all sending of new issues from axis territory, except by the long and tortuous Russian route. Even such shipments were often intercepted, so axis new issues were not common, except on such mail as did get through. Britain established control of stamp transactions, and all sales and purchases cleared through the trade association, which thus became a quasi-official agency.

Commemoratives.—Commemoratives were, of course, limited mainly to the Americas, although Australia commemorated the Australian imperial forces, embracing all the branches of the service, with a short set of four values, showing the army, navy, flying and nursing corps. The United States commemorated the first peacetime conscription with a set of three values issued on the day of registration (Oct. 16, 1940), with martial emblems, signifying "preparedness" and called the defence issue.

The 50th anniversary of the Pan American union was noted philatelically by several issues of stamps. The United States borrowed from Botticelli's "Primavera" the three dancing figures, used to symbolize the three Americas, South, Central and North. Most of the other members of the union did likewise, though some went to great lengths—in numbers of stamps. Brazil used the portrait of Franklin D. Roosevelt and Brazil's own president,

Getulio Vargas, as the design. On President Roosevelt's request, other nations, which had planned likewise, dropped his picture.

Cuba recognized the visits of two international conventions by stamps, Rotary International and Lions International being thus honoured. Great Britain, despite war worries, broke an old tradition and issued stamps celebrating the 100th anniversary of Britain's and the world's first stamp, with portraits of Victoria and George VI in a traditional frame and background.

Albania, thought to have disappeared from the stamp-issuing world, reappeared with a set of regular and a set of air-mail stamps showing Italian possession.

The United States, besides having the great set of "Heroes of Peace," also commemorated the 75th anniversary of the abolition of slavery by the 13th amendment to the constitution. Also appeared a stamp commemorating the 80th anniversary of the pony express mail service; the 50th anniversary of statehood for Idaho; a similar one for Wyoming, and one for the Cuartocentennial of Coronado, who first explored the southwest.

Literature.—Philatelic literature was enriched by several new books. For beginners and advanced collectors alike, *So You're Collecting Stamps!,* by Mannel Hahn, is a guide book to ways and methods in the hobby, while *Paper Chase,* by Alvin Harlow, is a history of great finds of rare stamps. For specialists, *The Mississippi River and American Waterways Packet Markings,* by Eugene Klein, is one of the outstanding works of the century. As might be expected, these are the products of the U.S., but in Britain another standard work on postal history appeared: *The Postmarks of Great Britain and Ireland,* by R. A. Alcock and F. C. Holland.

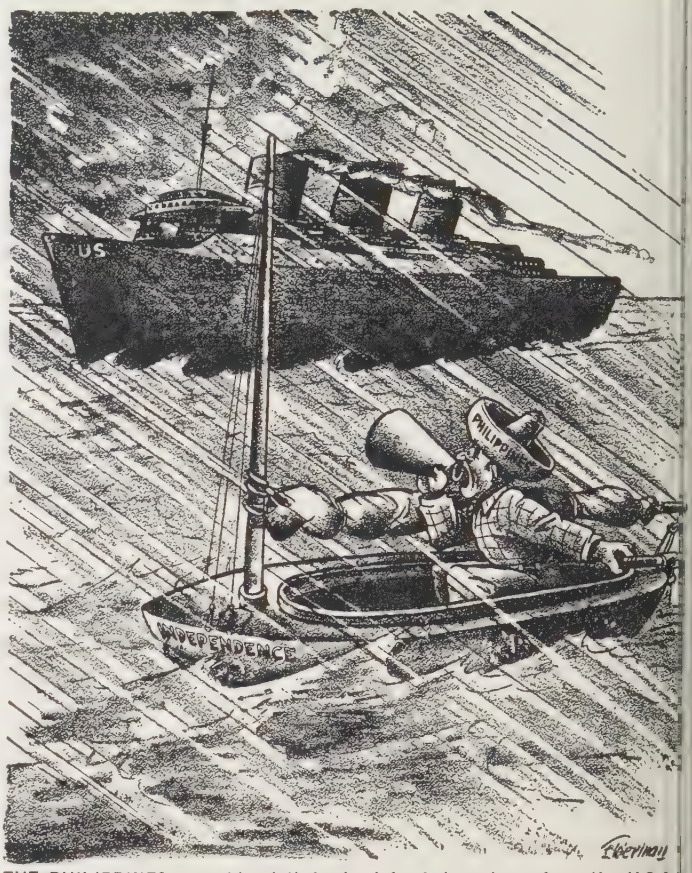
Personnel.—Fred J. Melville, dean of British and world-wide philatelic writers, died early in 1940. He was a most prolific writer, but quantity did not interfere with a high quality in his work. He was the author of the article on philately in the *Encyclopædia Britannica,* and also of other standard works. The annual British Philatelic congress proposed a memorial in his honour.

In the United States, H. M. Southgate, of Chevy Chase, Md., passed away in Oct. 1940. He was the founder of the Bureau Issues society, which has done more to focus attention on the work of the bureau of printing and engraving of the U.S., producers of that country's postage stamps since 1894, than any other group, and was one of its greatest students. His close connection with many agencies of the post office department was the source of much of the material on U.S. issues that appeared since 1920, not only in his own voluminous writings, but in those of many others, including the late Beverly King, for whom he secured many original records and drawings. He was the most active of all philatelists in securing the passage of the illustrations law, by which stamps of the U.S. may, under proper restriction, be reproduced for study and comparison in philatelic works.

The defence measures of the United States removed another of the heads of the U.S. Post Office Philatelic agency, for Otho L. Rogers, who headed the bureau since 1937, was called to his post as a captain in the marine corps reserve. No successor was appointed in 1940. (M. Ha.)

Philippines, Commonwealth of the.

The Philippine islands, over 7,000 in number, lie southeast of China, entirely in the tropics, extending for a distance of 1,152 mi. from north to south; area, approximately 114,400 sq.mi.; population (1940) 16,356,000. United States high commissioner, Francis B. Sayre; president of the commonwealth, Manuel L. Quezon; vice-president of the commonwealth, Sergio Osmeña; resident commissioner at Washington, Joaquín M. Elizalde;



THE PHILIPPINES reconsidered their stand for independence from the U.S.A. in 1940, as pointed out by Elderman of the *Washington Post* in this cartoon captioned "Are You Standing By?"

status until 1946, United States possession; basic law, Philippine Independence act, passed in 1934, amended in 1939 and Philippine constitution adopted in accordance therewith; national assembly unicameral. Until full independence is acquired on July 4, 1946, constitutional amendments and all legislation affecting currency, coinage, imports, exports and immigration require the approval of the president of the United States; acts tending to impair the financial standing of the Philippines may be suspended by the president of the United States; foreign affairs are under control of the United States; decisions of local courts are subject to review by the supreme court of the United States.

History.—*Changes in Economic Legislation Effective in 1940.*—Reciprocal free trade between the United States and the Philippines, established in 1909, resulted in a high standard of living in the Philippines, a close integration of Philippine with United States economy and in some instances sharp competition with agricultural production in the continental United States. By 1934 it was obvious that too abrupt a severing of Philippine-United States economic ties would prove disastrous to the Philippine economy. The Philippine Independence act of 1934, therefore embodied a program based on the grant of independence at the end of a ten-year interim period, during which a Philippine commonwealth government was to function with broad home-rule powers and Philippine economic dependence upon United States markets was to be lessened through the imposition of moderate but progressively increasing restrictions upon Philippine exports to the United States.

Accordingly, the Independence act, while continuing United States-Philippine trade generally on a duty-free basis during the ten-year period prior to independence, established annual duty-free quotas for sugar, coco-nut oil and cordage, with shipments beyond the quota amounts subject to the full American duty. In

also provided for the imposition by the commonwealth during the second half of the ten-year period of export taxes upon Philippine goods shipped to the United States, equal, in 1941, to 5% of the applicable United States import duties, if any, and increasing by 5% each year until they reach 25% in 1945–46. After the date of independence, that is, July 4, 1946, all Philippine products shipped to the United States were to be subject to 100% of the United States duties. The proceeds of these export taxes are to be paid into the United States treasury to be held as a sinking fund for the payment of Philippine bonded indebtedness.

In order to prevent certain basic Philippine industries from being dangerously disrupted or wiped out by the export taxes required under the Independence act, a Joint Preparatory Committee on Philippine Affairs, established by President Roosevelt in April 1937, after a year's intensive study recommended that Philippine export taxes should not be imposed upon shipments of coco-nut oil, cigars, scrap and filler tobacco and pearl buttons, but that in their stead a quota should be imposed restricting the duty-free shipments of each of these commodities to the United States to a progressively diminishing amount. Furthermore, the joint committee believed that as an inevitable consequence of the abrupt elimination of all Philippine preferences in the United States market at the date of independence "a number of important enterprises in the Philippines will be forced to liquidate much more rapidly than new enterprises can probably be developed to replace them." Accordingly, the committee recommended that subsequent to independence U.S. duties should be progressively increased by 5% a year beginning at 25% of the full U.S. duties in 1946 and reaching 100% in 1961. These two major recommendations of the committee, together with a number of minor ones, were embodied in a bill introduced in congress early in 1939.

Various members of the senate, however, felt that it would be premature at that time to enact trade provisions for the period following 1946. Accordingly, the post-independence provisions were dropped from the bill; and provision was made for the calling of a joint trade conference at least two years prior to 1946 "for the purpose of formulating recommendations as to future trade relations between the United States and the independent Philippine republic."

As thus modified, the bill substantially embodying the various recommendations of the joint committee with respect to the commonwealth period was passed by congress and approved by President Roosevelt on Aug. 7, 1939. The principal provisions of this act came into force on Jan. 1, 1940. The new export taxes and reduced quotas under this act first became effective on Jan. 1, 1941.

Question of Political Independence.—Notwithstanding the fact that the Independence act provides for complete independence in 1946, future political relations between the United States and the Philippines continued through 1940 to be the subject of active discussion. Although Filipino political leaders who have spent the greater part of their lives struggling to attain Philippine independence find it well nigh impossible, now that it is in sight, to oppose it, there is nevertheless a growing feeling of uneasiness on the part of business and other groups lest independence entail grave economic disruption and possible disaster and lest it also lead to conquest of the Philippines by a totalitarian nation.

For several years the commonwealth government has been following a carefully prepared program of military training which it believed would provide sufficient defensive power by 1946 to make an invasion of the islands too costly to be profitable. In the light of recent international events, however, President Quezon, on March 26, 1940, publicly stated that the Filipinos would not be able to defend their shores against aggression by a first-class power for some time after independence.

President Quezon and other outstanding Filipino leaders nevertheless continued during 1940 to advocate political independence in 1946 as scheduled.

Constitutional Amendments.—Three amendments to the Philippine constitution were proposed by the national assembly by a resolution of Sept. 15, 1939, as amended by a resolution of April 11, 1940. These amendments provide for (1) a four-year term in place of the present single six-year term for the commonwealth president and vice-president, provided that no person may serve as president for more than eight consecutive years; (2) a bicameral legislature in place of the present unicameral national assembly, by creation of a senate to be elected at large and a house of representatives; and (3) the establishment of a commission on elections to administer all laws relating to the conduct of elections. These amendments were approved by plebiscite of the electorate on June 18, 1940 and were approved by the president of the United States, as required by the Philippine Independence act, on Dec. 2, 1940.

Important Legislation.—A new immigration law was enacted by the commonwealth in May 1940 and approved by the president of the United States to become effective Jan. 1, 1941. This act provides for a quota system under which not more than 500 "quota immigrants" of any one nationality may be admitted into the Philippines in any one year.

The Philippine constitution provides that the public school system shall be "primarily conducted in the English language." An act (No. 570), approved June 7, 1940, declares Tagalog "one of the official languages of the Philippines" after July 4, 1946. President Quezon announced in a speech on Feb. 25, 1940 that Tagalog would be the medium of instruction in the elementary grades of public schools after independence. Tagalog is a dialect spoken in Manila and in the surrounding regions of central Luzon and at the present time more Filipinos are said to speak and understand English than they do Tagalog.

Much attention was attracted by a Commonwealth act (No. 600) approved on Aug. 14, 1940, giving to President Quezon remarkably broad emergency powers. This act, almost bare of restrictions and limitations, empowers him in sweeping terms to suppress subversive activities, to require citizens "not engaged in any useful occupation" to work on farms or elsewhere, to take over farm lands and industrial establishments to ensure continued production, to prohibit lockouts and strikes, to regulate hours of work, rents and prices of articles "of prime necessity," to take over "any public service or enterprise," to commandeer ships and other means of transportation and to prevent monopolization.

General Political Issues.—In a public address on July 16, 1940, President Quezon declared that Filipinos must discard the "fetish" that democracy cannot exist without political parties. His views, which were interpreted as advocating a one-party system, were widely commented on throughout the United States. Subsequently, President Quezon indicated that it was not a one-party system but a no-party system that he desired.

During 1940 President Quezon and General Emilio Aguinaldo were reconciled after many years of political and personal differences. Mr. Quezon broke with General Aguinaldo in the early '20s when the latter remained loyal to Governor General Leonard Wood during Mr. Quezon's political attack against him. Subsequently General Aguinaldo unsuccessfully ran against President Quezon for the presidency of the commonwealth. General Aguinaldo, ever since the Philippine insurrection, has been head of the veterans of that uprising and for a number of years was the chief independent political opponent of Mr. Quezon.

Trade and Finance.—Philippine imports totalled $122,767,-

728 in 1939, 7·4% less than in 1938. Exports totalled $158,052,-803, 7·5% greater than in 1938. Imports from the United States were $83,776,695, 7·7% less than in 1938. Exports to the United States were $129,657,032, an increase of 6·6% over 1938. The United States continued to be by far the most important supplier of Philippine imports and the chief market for Philippine exports, accounting for 68% of its total imports and 82% of its total exports. Japan, which ranked second, provided 6% of the Philippines' imports and took 5% of its exports. Philippine imports of cotton cloth from Japan were limited by a "gentleman's agreement" under which Japan undertook not to export to the Philippines more than 11,250,000 square metres of such cloth in any quarter. This agreement, which first became effective on Aug. 1, 1935, was renewed for one year, beginning Aug. 1, 1940.

The general fund, central government, showed 1939 income $51,195,077 and expenditures $56,372,681—respectively 16% and 4% over corresponding figures for 1938. The accumulated current surplus account was $29,029,386 at the end of 1939 or 17·5% below 1938. In addition to local income, the central government receives about $17,000,000 annually from the United States coconut oil excise tax. The public debt was $73,028,500 at the end of 1939. Against this were sinking funds of $35,103,592. The United States government is not responsible for Philippine public bonds issued after May 1, 1934. (*See* also CHROMITE; GOLD; MINERAL AND METAL PRICES AND PRODUCTION; RICE.) (F. B. S.)

Philosophy. The collapse of France in 1940 and the besiegement of popular institutions in Europe, if not in America, have laid harsh emphasis on what is called the moral decay of the democratic cultures. Morality, indeed, as well as morale, is probably the most urgent philosophical problem, not only of the liberal societies but also of those peoples who threaten them. Their respective statements are different, but in both cases it is a matter of the morals of survival and what is necessary to that end. War imposes its own morality on all who participate. In this case the compulsion is towards intense social solidarity, co-operation, power as the prime desiderata.

Though it is true of course that the moral superiority or moral decadence of a culture may not be wholly demonstrable by the military results, victory or defeat at arms does impose a new and often very difficult moral problem on the members of a group. It may completely change the moral universe in which they operate. General Pétain in asking lenience of Germany for France is reported to have said, "If you will master your victory, we shall try to master our defeat." This for more than two decades has been the most urgent moral problem.

In addition to these unorganized philosophies of defeat and victory, of fear and rage, of ideological pluralism, democracy, the experimental point of view and of ideological monism or totalitarianism, 1940 was marked by the publication of several philosophical books of more traditional importance.

George Santayana's *The Realm of Spirit* completes his great series on the realms of being. In this realm of pure awareness, disintoxicated as it were from values, Santayana elaborates on a different and perhaps more mystical basis the philosophical attitudes that he expressed 35 years ago in his *Life of Reason*. Probably the difficulty that many readers find in his latest book as in most of his other works is that Santayana, after the classical manner, tries to deal separately with functions and factors of the human situation that are intelligible only in a "gestalt" or integrated whole. He is a convinced materialist, but his separate realms of essence, of spirit, of truth are with difficulty integrated with his realm of matter. These problems are faced with simplicity and frankness in Santayana's rejoinder to a group of essays on his work entitled *The Philosophy of George Santayana*, vol. II of *The Library of Living Philosophers* edited by Paul A. Schilpp. The rejoinder, which occupies the latter part of the book, is the clearest and perhaps philosophically the most important of his works. Faced by his friends and critics, the poet and philosopher tries to come to terms with the seeming contradictions and obscurities of his work.

In *The Ways of Things* W. P. Montague brings to fruition his animistic materialism. More naïvely, but also with a more modern directness than does Santayana, he too tries to include spiritualism in his materialism. By means of the concept of anergy he identifies consciousness with the potential energy resident in the nervous system. This assumption that potential energy is a substantive presence of some sort rather than a certain kind of absence of action may be doubted by the scientifically-minded person, but the concept of anergy is at least a fresh and courageous attempt to reconcile spirit with matter.

Max Otto in *The Human Enterprise* asks what philosophy can do as a social and human influence in this era of change. Can it take over the function that religion once had? Reality for Otto is not something behind experience but includes whatever reality is experienced to be, and values stand not on a cosmic pedestal but on an intimately human foundation. He reaffirms his well known agnostic position as to God and builds his philosophy as a humanistic instrument of intervention in social and individual affairs.

In E. S. Brightman's *A Philosophy of Religion* the "given" is treated as external to God's will and thus imposes limitations on it. Only by accepting the finiteness of God, says Professor Brightman, can we face clearly the conditions of our world. In *An Inquiry Into Meaning and Truth* Bertrand Russell makes his first major contribution to semantics and the analysis of language. Among other books of 1940 are *Philosophical Essays in Memory of Edmund Husserl* edited by Marvin Farber; *Die Sachlichkeit der Wissenschaft* by Max Wundt; *The Arts and the Art of Criticism* by T. M. Greene; *Civilization in East and West* by H. N. Spaulding; *The Nature of the World* by W. T. Stace. A non-technical book but of philosophical interest is *The Wave of the Future* by Anne Morrow Lindbergh. The foundation of the journal of *Philosophy and Phenomenological Research* should also be noted. (B. B.)

Phoenix Islands: *see* PACIFIC ISLANDS, BRITISH.

Phosphates. Mineral phosphates, chiefly phosphate rock, a phosphate of calcium, are basic fertilizer material, and as such support an extensive producing industry. A world production of 11,760,000 metric tons in 1930 declined to 6,678,000 tons in 1932, and recovered to 12,050,000 tons in 1939. The United States is the leading producer, with 32% of the total, followed by Tunisia 15%, soviet union 13%, French Morocco 12%, Ocean and Nauru islands 10%, Algeria 5%, and Egypt 4%. These seven countries account for 91% of the total, and the remaining 9% is scattered among about 30 others. The general producing area in northern Africa, including Tunisia, Morocco and Algeria, has not made any material recovery from the depression drop. Russia is the only producer which has shown an exceptional growth, increasing steadily from 200,000 tons in 1930 to 1,791,000 tons in 1938. The United States output of 3,989,000 tons in 1930 dropped to 1,734,000 tons in 1932, and rose to 4,019,-000 tons in 1937, about one-quarter of which was exported. In 1938 production declined to 3,799,000 tons, rising in 1939 to 3,817,000. (*See* also FERTILIZERS.) (G. A. Ro.)

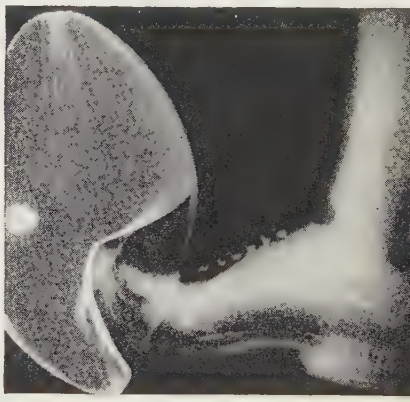
Photography. **General Photography.**—There were notable advances in several fields. The Kodatron

Above, left: THE ONLY PHOTOGRAPHS ever taken of albatrosses in U.S. coastal waters were snapped in June 1940 off the shore of California. To attract the birds, the photographer spread cod-liver oil and pieces of suet on the water

Above, right: AN UNMUFFLED SNEEZE, photographed in 1940 with high-speed camera equipment and a 1/30,000-sec. exposure to demonstrate the dangers of heedlessness in spreading disease

Left: PHOTOGRAPH made in 1/30,000 sec. using a Kodatron Speedlamp

Below: X-RAY PHOTOGRAPH made with 1/1,000,000-sec. exposure, of a player kicking a football



Below: AERIAL PHOTOGRAPH of Rochester, N.Y., taken at night in 1940. A flashlight bomb dropped from the plane and synchronized with the camera provided enough illumination for recording of small details

Speedlamp, designed by Edgerton, was introduced commercially. Operated by a condenser discharge in a gas-filled tube, it produces extremely bright flashes of 1/30,000 sec. duration and can be synchronized with camera shutters. Its uses are mainly in the commercial, illustrative, news and technical fields. Improvements in flash bulbs included the introduction of midget sizes, coating the bulbs with blue varnish to permit their use with daylight colour film and a device for permitting concentration of the light from flash bulbs on the subject. The treatment of lens surfaces to reduce reflections which cause flare and to increase the transmission of multi-component lenses is an established practice. New types of optical glass of high refractive index were made and lenses were prepared from plastic materials, the most interesting being a 16-in. aspheric condenser made from Lucite by turning on a lathe and polishing. It was used in the Kodak Research laboratories for illuminating colour transparencies for making separation negatives. Several varieties of variable contrast printing papers were introduced. They are improvements on papers first described by Fischer in 1912 and give contrasts which depend on the colour of the light by which they are exposed. They consist of mixtures of emulsions which give soft and hard contrasts and which are sensitive to different colours. By exposing them through blue or yellow filters, or combinations of them, a wide range of contrast is obtainable. Photography played an important part in the war, for propaganda, instruction, reconnaissance and the recording of the effects of aerial activity. Many planes carry cameras to record the effectiveness of bombing operations and the results of aerial combat. The necessity for high flying imposed by the effectiveness of anti-aircraft and fighter plane defence has required the use of lenses of long focal length combined with infra-red film of increased speed to permit penetration of haze. Infra-red photography was also used to detect camouflage and it was reported that colour photography was tried for this purpose.

In order to simplify defence, most aerial operations were carried out at night time and the U.S. army air corps published information about the use of large flash bombs dropped from the planes to permit photography of the ground at night. The flash is synchronized with the shutters of the cameras by photoelectric devices. The rapid pace of modern operations frequently makes it desirable to deliver photographs within a few minutes after the time they are made and with this end in view, methods of rapidly processing negatives and prints were worked out.

Large numbers of old photographs and negatives have faded, primarily as a result of having been inadequately fixed and washed. Hypo eliminators have been proposed with relatively little success, but it was shown that hypo can be eliminated very effectively with the result that negatives and prints can be rendered very stable. Negatives are washed, bathed for a short time in ammonia and washed again. In the case of papers, a weak solution containing ammonia and hydrogen peroxide is used. To prevent fading from external agents such as hydrogen sulphide gas, prints are toned with gold.

There was an increase in interest in stereoscopic photography. A number of commercial and educational stereoscopic motion picture and still films were made using twin lens cameras and projectors and viewing the picture pairs by Polaroid glasses.

In October, E. H. Land demonstrated an entirely novel method of making single stereo prints on paper for viewing through polarizing glasses and called Vectographic Three-dimensional pictures. There was also described the Winnek Trivision method of making stereoscopic transparencies, using lenticular film and capable of giving results in colour.

Many of the features of cameras which had an appeal to the advanced amateur are now (1940) being applied to the cheaper models of cameras so that greater flexibility of apparatus is available to those with limited resources. These applications included the use of the reflex principle and flash synchronizers in box cameras and the addition of coupled range finders to cheaper forms of miniature cameras.

The importation of photographic apparatus from Europe was materially reduced and American manufacturers made available models which should satisfy all needs and were also making shutters and lenses which are unsurpassed by any previously imported.

Several new models of exposure meter have appeared, both for estimating camera exposures and for determining printing times. New apparatus of high precision was available in the enlarging field and collapsible, portable enlargers were made for the itinerant photographer. The American Standards association had several committees actively engaged in photographic standardization and tentative standards were proposed for the estimation and specification of film speeds, film dimensions and projection equipment.

Colour Photography.—No new colour processes were disclosed during 1940 but there was a steady increase in the use of Kodachrome, particularly for making amateur motion pictures and colour transparencies in miniature cameras. Kodachrome in cut sheet form was replacing or supplementing to a significant degree the use of three-colour, one-exposure cameras and colour prints in the commercial advertising field, and the photoengravers have mastered very successfully the problem of making colour printing plates from such colour transparencies. The publication of the patents relating to Kodachrome and similar processes disclosed the names of chemicals which could be used to obtain colour images and a number of people took advantage of this to devise methods of making colour prints on paper and of toning prints in colours. There was some interest in making colour prints for commercial purposes by methods involving hand manipulation. In one method, black and white prints were bleached and redeveloped locally by coupler developers in conjunction with masking varnishes. In the Crawford Flexichrome process, a black dye image was made in a gelatin relief and colours were applied by a brush to replace the black dye as required and give a colour picture with modelling produced by the black dye left in it.

Motion Picture Photography.—There was a steady output of research in the motion picture industry, but no innovations of striking import appeared during the year. The decrease in the foreign market reduced production somewhat. The U.S. department of commerce report disclosed that at the beginning of 1940 there were 67,129 motion picture theatres in the world, of which 65,006 were wired for sound. Of interest is the increase in Latin America and the Far East, but the number of theatres in the United States, all wired for sound, increased from 16,251 in 1939 to 17,003 in 1940. There was a steady increase in the use and quality of Technicolor and the Disney-Technicolor film. *Fantasia* was an interesting experiment in the interpretation of music by the colour cartoon. In the field of amateur cinematography, which is a large branch of the whole photographic industry, there was a definite growth of interest in the use of 8-mm. film and magazine-loading 8-mm. cameras were introduced. There appeared to be an increase in the use of 16-mm. colour film for advertising and industrial purposes. Duplicates of 16-mm. colour films can now (1940) be made of high quality and sound can be printed on them from black and white sound records. Television was still in its infancy and most of the broadcasts were made by scanning motion picture film. The Columbia Broadcasting system demonstrated colour television using 16-mm. Kodachrome films as the subjects. The method used the additive three-colour principle, with a rotating disk carrying red, blue and green filters at the scanning and receiving ends.

Applications.—The interest in photography for documentary purposes was growing. Great projects were under way for copying official records and for supplying copies of works of art, books and other documents for distribution to schools, lecturers and the general public. Much of this was in colour and in the popular form of the 2-in. square slide. Salesmen were equipped with slides for demonstrating wares which it would be difficult to transport from place to place and these were frequently accompanied by dialogue from sound-on-film or disk. In the war countries, many photographs were made of valuable and irreplaceable documents for storing in several scattered localities, thereby eliminating the chance of destruction by aerial or other form of attack. A new photographic plate, known as the H.R. plate, was introduced and was of special value for the preparation of graticules. It gives a dense sharp image and has a resolving power of some 500 lines to the millimetre, far higher than any normal photographic lens.

Analogous to the discharge lamp used for making high speed photographs is the high-speed X-ray technique developed in the Westinghouse Research laboratories. A discharge from a bank of condensers is passed through a cold cathode X-ray tube, giving a surge of current of about 1/1,000,000 of a second in duration. X-ray photographs hitherto unattainable were thus made of rapidly moving objects, such as a bullet passing through a block of wood and the interior of a vacuum cleaner in operation. In photomicrography, the method of making colour photographs of etched metal surfaces of satisfactory colour quality appeared to have been worked out.

There was a steady growth of the application of colour in engraving and a method was demonstrated by which the copy is prepared by using fluorescent paints. Normal separation negatives are made, together with an additional negative using the fluorescence resulting from exposing the copy to ultra-violet radiation. From the combination, printing plates can be made which require less fine etching by hand than the normal methods.

The electron microscope produced some striking results during the year and its use was likely to increase with the availability of a commercial model. The instrument resolved structures impossible of resolution in the normal microscope. Results were published of its application to the study of the developed photographic silver grain, revealing a hitherto unsuspected fibrous structure.

There was a welcome increase in the teaching of the principles of photography in the schools, universities and camera clubs and a number of textbooks and instruction manuals were published.

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Photography, Miniature Camera.

Continuing the trend from 1939 and through 1940, there was a definite stepping up in the production and sale of the larger miniature camera sizes. These cameras include the $2\frac{1}{4}$x$2\frac{1}{4}$ reflexes such as the Rolleiflex, Ikoflex, Argoflex and the $2\frac{1}{4}$x$3\frac{1}{4}$ Miniature Speed Graphic. The smaller imported 35 mm. cameras have shown a falling off in sales volume during the last half of 1940. This change has come from the changing public purchasing and also from the difficulty of importing from Germany and other continental countries.

With the increasing effectiveness of the British blockade, there were few camera imports into England and America from Germany during the latter part of 1940. Small shipments came across the Pacific as well as the Atlantic oceans to America, but the mounting insurance and freight costs were costly factors. The large stocks of miniature cameras which came into England and America about the time the European war broke out in 1939 were sold before the close of 1940. This left the field open to the British and American camera manufacturers.

Domestic manufacturers have been slow to bring out new camera models. Outside of the cheaper miniature camera models such as the $2\frac{1}{4}$x$2\frac{1}{4}$ Argoflex, the Kodak 35 with coupled range finder and several streamlined Argus 35 mm. cameras there was little activity in new products.

The long awaited Kodak Ektra 35 mm. camera was shown for the first and only time at the Chicago Photographic convention in Aug. 1940. This new miniature camera has many distinctive features which will undoubtedly place it in the fine precision class along with the Contax and Leica cameras. The Ektra 35 mm. camera was originally scheduled for public sale during November, but by the end of 1940, the Eastman Kodak company reported that this camera would not make its appearance until sometime in 1941. Defence orders were one of the principal factors in the postponement.

Important features of the Kodak Ektra camera include: (1) interchangeable film backs to hold black and white or colour films; (2) compensating built-in view finder for various focal length lenses; (3) left handed film advance lever; (4) coated anti-reflection f/2 50 mm. lens, which is said to improve Kodachrome colour pictures; (5) special film counter, etc. Price of the Ektra camera would be in the same class as the Contax and Leica.

While the development of new miniature cameras was slow during 1940, there was a greater change in the accessory fields. Here many new products appeared every week for all the miniature cameras.

These included new filters, lens shades, combination filter mounts and lens shades, copying attachments, stereoscopic attachments, range finders, self timers and special carrying cases.

There was also a trend for the production of adapters which permit the use of 35 mm. films in the larger miniature cameras such as the Super Ikonta B and the Rolleiflex and Rolleicord. There was also a Kodak Bantam adapter which fits on the back of the Recomar and similar cameras. This latter 35 mm. adapter permits direct ground glass visual focus. The adapter film back is then slid into position for making the exposure. These adapters permit the economical use of 35 mm. Kodachrome film in the larger cameras.

A new trend which promised to continue with mounting sales during 1941 was seen in the miniature box cameras with built-in flash units. Agfa Ansco introduced the Agfa Pioneer and Agfa Chief cameras followed by the first Kodak Brownie Flash camera which made its appearance toward the end of Dec. 1940. These cameras which sold at prices below $4.00 produce good pictures and require nothing more than the snapping on of the flash unit to make them ready for taking pictures with flashbulbs.

Related to the miniature camera field are the numerous so-called fine grain developers which were introduced during 1940. All these new developers were placed on the market by small firms which advertised extravagant claims, such as increased film speeds, finer grain, greater tone gradations, etc. Without exception, these claims were not fulfilled.

Result was that by the close of 1940 most of these new glamour developers were either off the market or their sales dwindled to an all-time low for the year. Photographers were finding that the standard developers produced by the larger photographic manufacturing firms insured the production of good miniature camera negatives. The new untested developers carrying their fantastic claims were meeting harder sales resistance. (*See* also PHOTOGRAPHY.) (W. D. MN.)

Physics. Physicists outside America during 1940 were mostly occupied with research on secret war problems or were prevented from continuing their scientific work by war. This article will therefore be concerned with scientific work done in the United States.

Nuclear Physics.—The fission of uranium atoms discovered in 1939 was the subject of several researches. A. O. Nier at the University of Minnesota obtained minute quantities of pure uranium of atomic weight 235 by separating this isotope from the much more abundant uranium of atomic weight 238 by means of a mass spectrograph. He found, as was expected, that the uranium 235 undergoes fission when exposed to slow neutrons but that the uranium 238 does not.

If a large quantity of pure uranium 235 could be obtained it could be used as a source of heat energy for power production. For example it could be used to drive an aeroplane and would enable the aeroplane to stay up almost indefinitely without having to come down to refuel. The uranium 235 undergoes fission when exposed to neutrons and emits neutrons during fission so that fission should continue in a sufficiently large quantity. The energy evolved during fission is enormous. One pound of uranium 235 would give 10,000 h.p. for more than a month. The difficulty of separating large quantities of pure uranium 235 is very great but since small quantities have been separated it is certainly possible that the difficulties may eventually be overcome.

Grosse and Booth at Columbia university found that zirconium and columbium are produced by uranium fission. At least one radioactive isotope of every element from bromine to ekamanganese and from antimony to lanthanum has been found among the products of uranium fission.

Many nuclear reactions were studied during 1940: as an example, the carbon deuterium reactions studied by Bonner and Bennett at the Rice institute. In these reactions a deuterium atom of atomic weight 2 combines with a carbon atom of atomic weight 12 to give a nitrogen atom of atomic weight 14. The nitrogen atom is in an excited state with more than its normal energy and may emit its excess of energy as a gamma ray or it may emit a proton so changing to carbon of atomic weight 13 or a neutron so changing into nitrogen of atomic weight 13. The carbon was bombarded with high velocity deuterium nuclei and the way in which the yield of gamma rays, protons and neutrons varied with the kinetic energy of the deuterium nuclei was determined. It was found that there are a series of energies at which the yields have maximum values.

Cosmic Rays.—The heavy electrons or mesotrons discovered in cosmic rays in 1938 were investigated by several observers in 1940. The mesotron is a charged particle with a mass about 200 times that of an electron and so far has only been found in cosmic rays. It is believed that mesotrons are unstable so that after a very short life of only a few millionths of a second they disintegrate into an ordinary electron and a gamma ray or neutrino. Neher and Stever of the California Institute of Technology estimated the average life of mesotrons by comparing the absorption of cosmic rays in water with that in an equal mass of air. They made measurements in two lakes, one about 13,000 ft. above sea level and the other 1,000 ft. The cosmic ray intensity was measured with an electroscope at different depths below the surface of each lake. Twelve thousand feet of air has the same mass per square foot as about 12 ft. of water, so the measurements in the upper lake were compared with those in the lower lake at depths 12 ft. smaller. The cosmic rays at the upper lake therefore passed through 12 ft. more water but 12,000 ft. less air than at the lower lake. It was found that the cosmic ray intensity was about 15% greater at the upper lake. This difference was attributed to the disappearing of some of the mesotrons as they moved down 12,000 ft. through the air. The mesotrons travel with nearly the velocity of light and so take about 1/100,000 of a second to go 12,000 ft. The average life of a mesotron at rest was calculated from these results to be about 3/1,000,000 of a second.

Herzog and Bostick at Chicago during an aeroplane flight at 29,000 ft. obtained a remarkable photograph showing production of a pair of mesotrons in a Wilson expansion chamber. One mesotron was positive and the other negative and it is supposed that they were produced by a high energy photon just as positive and negative electron pairs are produced. To produce a pair of electrons requires a photon of more than 1,000,000 electron volts energy; so, to produce a pair of mesotrons requires a photon of more than 200,000,000 electron volts energy. Herzog and Bostick also obtained photographs showing the production of an electron at the end of a mesotron track presumably by the disintegration of the mesotron.

Variation of Mass with Velocity.—According to Einstein's theory of relativity energy has mass so that the mass of a moving particle is greater than its mass when at rest, the difference being the mass of its kinetic energy. The increase of mass is small until the velocity approaches that of light. If m denotes the mass at rest, then the mass when moving with a velocity v is $m/\sqrt{1-v^2/c^2}$ where c is the velocity of light. This fundamentally important result was verified experimentally many years ago by Kaufmann and later by Bucherer and others by observations on the electrons emitted by radium which have velocities up to nearly that of light. A critical examination of these experiments showed that they were much less exact than had been supposed so that Einstein's relation between mass and velocity was not really verified except very roughly.

Rogers, McReynolds and Rogers at the Rice institute have made accurate measurements of the masses and velocities of the three intense beta rays emitted by radium B. The rays were deflected by a radial electric field X so that they moved along a circular path of radius R and $XR=mv^2/e$ where m is the mass, v the velocity, and e the charge. Previous measurements on the deflection of these rays by a magnetic field H give $H\rho=mv/e$ where ρ is the radius of the circular path in the magnetic field. Hence $v=XR/H\rho$ and $m=e\ (H\rho)^2/XR$. The three beta rays were found to have velocities 0·6337, 0·6961 and 0·7496 of that of light and the masses agreed accurately with those calculated by Einstein's equation.

Electron Microscopes.—During 1940 an electron microscope was developed by the RCA Research laboratories suitable for use in biological and other researches. In such instruments a beam of high speed electrons is used instead of light. The electrons are focussed by means of suitable magnetic fields instead of the lenses used in ordinary microscopes. The smallest object the structure of which can be seen with a microscope has a length about equal to that of the wave length of the light used which, with ordinary light, is a few hundred thousandths of an inch. Electron waves are much shorter than light waves so with an electron microscope the structure of much smaller objects can be seen and much higher magnifications usefully employed. Magnifications of 20,000 diameters have been used with electron microscopes and the structure of bacteria and other small bodies, much too small to show any structure with ordinary microscopes, can be seen. It is even claimed that the individual molecules in some crystals can be observed. The electron microscope will certainly prove a very valuable instrument for scientific research.

Thermionic Emission from Crystal Faces.—The emission of electrons by metals at high temperatures was thoroughly investigated by O. W. Richardson and many others early in the present century. The commercial applications of this thermionic emis-

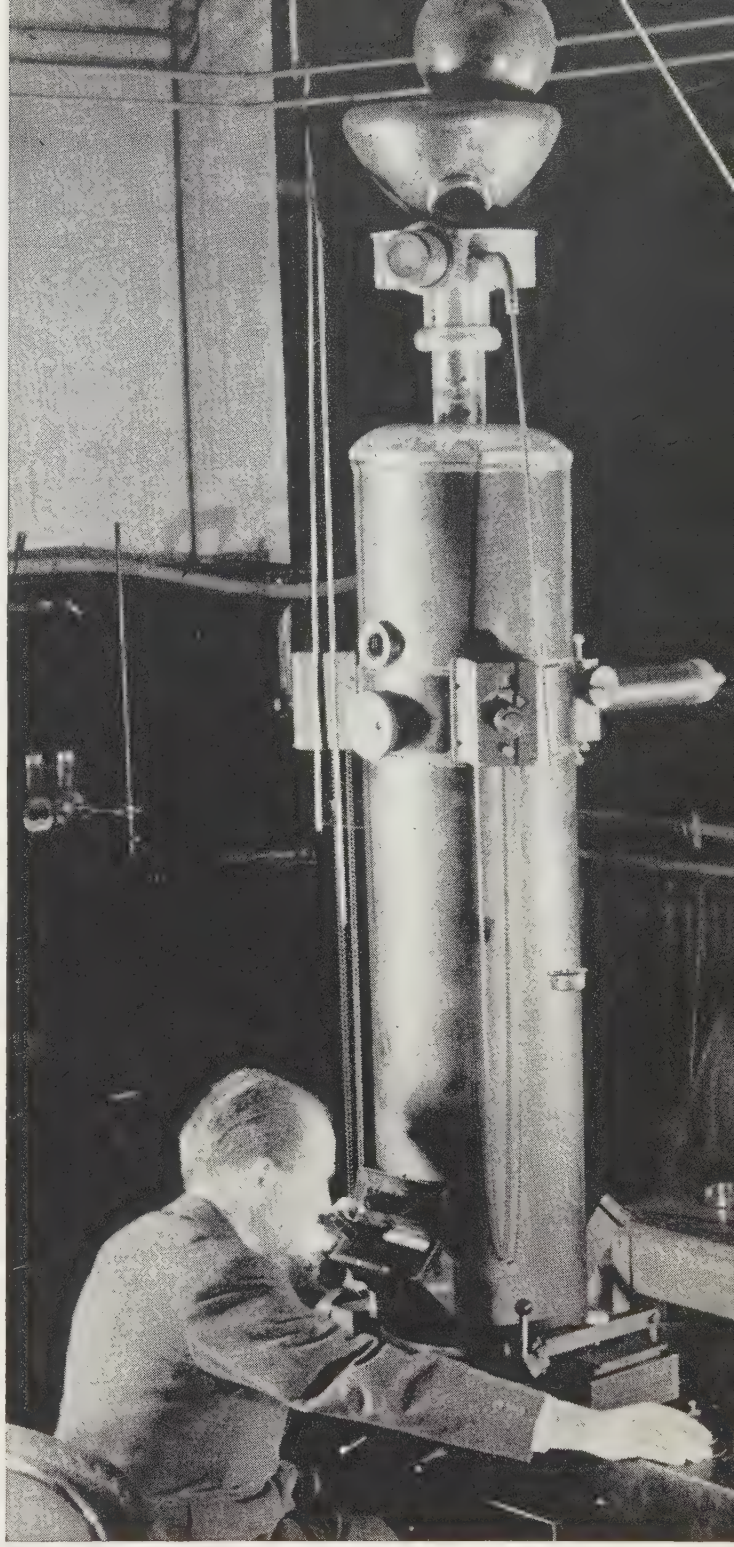
sion in the vacuum tubes used in radio, long distance telephony and for many other purposes are well known. The emission has hitherto been studied with ordinary metallic wires consisting of many minute crystals orientated at random. In 1940 M. H. Nichols at the Massachusetts Institute of Technology published an account of experiments on the thermionic emission from tungsten wires consisting of a single crystal with one of the face diagonals parallel to the axis of the wire. He found that the emission is different from different faces of the crystal. The thermionic work function, which is a measure of the work an electron must do in order to escape from the metal, varied from 4.35 volts for the (111) crystal direction to 4.65 volts for the (110) crystal direction. These results will be useful in connection with the theory of thermionic emission and electrical conductivity of metals.

Radiofrequency Spectra of Molecules.—At Columbia university Rabi and his collaborators continued their important work on radiofrequency spectra of molecules in a magnetic field. They studied the hydrogen deuterium molecule and the deuterium deuterium molecule. In this work the molecules are orientated by a strong steady magnetic field, and a weak rapidly oscillating magnetic field perpendicular to the steady field also acts on them. The frequency of the alternating field is varied and it is found that for certain definite values of this frequency the orientation by the strong steady field is destroyed. From the values of these frequencies the magnetic moments of the molecules and their component atoms can be calculated. They find it necessary to assume that the deuteron, that is, the nucleus of a deuterium atom, has a quadrupole electrical moment. Two equal electrical charges, one positive and the other negative, very near together have a dipole moment equal to the product of one of the charges and the distance between them. Two equal positive charges e with a negative charge $-2e$ between them give a quadrupole moment. Since a deuteron is supposed to consist of an electrically neutral particle or neutron and a positively charged particle or proton it is surprising that it should appear to have a quadrupole moment.

Giant Cyclotron.—The Rockefeller foundation made an appropriation of $1,150,000 to the University of California for the construction of a 4,500 ton cyclotron. The university will provide an additional $250,000. The cyclotron will be built under the supervision of E. O. Lawrence who was awarded a Nobel prize for his invention of the cyclotron. The magnet of the cyclotron will have two flat circular pole pieces 15 ft. in diameter and 3 ft. 4 in. apart. It will be built out of steel plates with a total weight of about 4,500 tons. Between the pole pieces there will be a vacuum chamber containing a circular metal box divided into two equal halves called dees. By means of an electrical oscillator an alternating voltage will be maintained between the dees. Positively charged atoms such as protons or deuterons are supplied by an ion source near the centre of the dees. The positively charged atoms move round circular paths inside the dees in the magnetic field of the large magnet. Half of each circular path is in one dee and half in the other. The frequency of the alternating voltage between the dees is adjusted so that the voltage is reversed twice during the time an atom takes to go once round. As an atom goes from one dee to the other it is accelerated by the voltage between the dees and so as the atom goes round and round it is accelerated twice during each revolution. The circular paths get larger as the velocity of the atom increases so that the time to go once round remains constant. If for example the voltage between the dees is 50,000 volts then when the atom has gone round 1,000 times it will have kinetic energy corresponding to 100,000,000 volts.

With the giant cyclotron it is expected to obtain deuterons with 100,000,000 volts energy. These high energy particles will be used to produce atomic disintegrations and the results are expected to greatly increase the knowledge of atomic structure. It is expected that the new cyclotron will be completed by 1944.

(H. A. W.)



ELECTRON MICROSCOPE with magnifying power of 25,000 diameters, demonstrated in April 1940 by Radio Corporation of America

Physiology. Several interesting and important contributions were made in a number of physiological fields during 1940. A gastric-secretory inhibitory substance was found in canine and human urine. It was termed "urogastrone" to distinguish it from enterogastrone. Enterogastrone is formed when fats come in contact with the mucosa of the upper intestine and inhibits gastric secretion and motility. The source of uro-

gastrone in the body has not been determined with certainty. Urogastrone has been obtained in a form sufficiently pure to permit its experimental use in the human subject. When injected subcutaneously, this substance depresses the secretion of acid by the stomach in normal persons. It is hoped that urogastrone will prove to be of value in the management of peptic ulcer, especially in those patients who secrete large amounts of acid. The substance, however, is not available in sufficiently pure form nor in sufficient quantity to permit its clinical trial.

Hypertension.—A number of facts of both theoretical and practical importance were revealed by extensive investigations in this field. In previous years a substance called renin was extracted from the kidney. Its intravenous injection causes a rise in blood pressure. From careful studies of the mechanism of renin tachyphylaxis (decreased blood-pressure-raising response to repeated injections), it has been concluded that renin is an enzyme without pressor properties *per se* and reacts with an activator present in the blood to form a pressor substance. The latter may provide the body with an humoral mechanism for the regulation of blood pressure. This pressor substance has been called "angiotonin" and its isolation as the crystalline oxalate and picrate was announced. It is believed that the development of renin tachyphylaxis is the result of two factors: (a) the exhaustion of renin activator and (b) the appearance of an antipressor substance. Attempts to isolate this antipressor substance have led to results which may prove to be of considerable clinical importance. A substance was found in kidney extracts which effectively reduces arterial pressure in hypertensive human beings, dogs and rats for prolonged periods and simultaneously reduces the ability of the plasma to activate renin and angiotonin. The active principle appears to be distinct from all known depressor substances. It has been tested only in a limited number of human patients and has produced a sharp and prolonged fall in blood pressure and marked symptomatic improvement.

The evidence available is inadequate to permit any statement in regard to its ultimate clinical value, but the results so far obtained appear to be promising.

Intermediary Metabolism.—When "tracer elements" (isotopes) were made available by the physicist and physical chemist, a very useful method for tracing the fate of various food elements in the body was provided. The stable isotopes of hydrogen, oxygen, nitrogen, carbon and sulphur produced by fractionation of the natural elements have been available for some time and have been employed in the study of intermediary fat and protein metabolism.

When these "tracer elements" are introduced into the fat molecule or the amino acid (building stone of protein) molecule, the molecule is labelled. This renders it possible to determine how the body utilizes and disposes of the labelled molecules. With the perfection of the cyclotron, a large number of artificially produced radioactive "tracer elements" have become available.

During 1940, synthetic thiamin (vitamin B_1, anti-beri-beri vitamin), prepared with radioactive sulphur, was employed to follow the course of this vitamin in the body. Radioactive calcium was employed to time the passage of this element through the body. It was found that a period of 12 hours is necessary for a test dose of radioactive iron to pass through the stomach and small intestine of the rat. It was also demonstrated in these studies that 50% of the absorbed iron accumulated in the muscles and that anaemic rats retained almost twice as much of the ingested iron as normal rats. Tracer elements provide information which often cannot be obtained in any other way. The field is new and promises to yield a vast amount of useful information.

Physiology of Flight and High Altitudes.—Renewed interest in aviation, stimulated by the European war, intensified research in this field. A considerable number of investigations were carried out both during actual flight and also during "ascents" in specially designed low pressure chambers. A condition similar to caisson disease in divers has been described in aviators. This condition, called aeroembolism, is due to the liberation of nitrogen bubbles in the blood and tissues during rapid ascent to high altitudes. It has been found that the condition can be prevented if 100% oxygen is breathed during a 30 min. period prior to the ascent.

The oxygen requirements of parachutists leaping from high altitudes have been studied and special devices developed to insure an adequate supply.

(*See* also VITAMINS.)

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(A. C. I.)

Pickwick Landing Dam: *see* TENNESSEE VALLEY AUTHORITY.

Pierce, Palmer Eddy (1865–1940), retired U.S. brigadier general, was born in Savanna, Ill., Oct. 23 and was graduated from the United States Military academy in 1891. He served in the Spanish-American War in 1898 and in the Philippines (1899–1901), then returned to the military academy as assistant professor of philosophy. He was named a member of the army general staff in 1916, serving there until the United States entered the World War in 1917, when he was appointed to the War Industries board to represent the secretary of war. Later he became a member of the secretary's war council. He went to France in May 1918, in command of the 54th Infantry brigade of the 77th division and saw active service.

He received the Distinguished Service medal from congress and was made a Companion of the Bath by the British. He entered the legal department of the Standard Oil Company of New Jersey in 1920 and was named assistant to the president in 1929. After his retirement in 1933, he interested himself in Pan American affairs. He died in New York city, Jan. 17.

Pierlot, Hubert (1883–), Belgian statesman. He was minister of interior in the cabinet of Broqueville in 1934, held the same office in the Theunis cabinet in 1934–35, and was minister of agriculture (1937–38) in the Janson cabinet. In Feb. 1939 he became prime minister. His cabinet weathered all storms until Jan. 5, 1940, when he submitted his resignation to the king but was immediately commissioned to form a new government. In May the German invasion forced Pierlot to move his government to France, where he condemned the unconditional surrender of King Leopold. After the French surrender Pierlot fled to Barcelona, Spain and thence to London, where he arrived Oct. 22 from Lisbon after escaping German planes. Here he established his government-in-exile.

Pig Iron: *see* IRON AND STEEL.
Pigs: *see* HOGS; LIVESTOCK.

Pineapples. A short crop of only 8,000 boxes was reported in 1940 from Florida, the only commercial

neapple-growing area in the United States. The 1939 Florida rop of pineapples was 15,000 boxes, and the ten-year (1929–38) verage was 14,250 boxes. Receipts of pineapples in the United tates from Hawaii, Cuba and Mexico increased substantially in 940. Pineapple shipments to the United States for the fiscal ears ending June 30, 1940 and 1939, together with their value, ere as shown in the table.

Pineapple Shipments to the U.S., Fiscal Years 1940 and 1939

	1940		1939	
	Quantity	Value	Quantity	Value
Pineapples fresh	107,000 boxes	$214,000	109,000 boxes	$198,000
Pineapples canned	499,443,000 lb.	31,822,000	467,983,000 lb.	29,769,000
Pineapple juice	292,842,000 lb.	15,556,000	278,936,000 lb.	15,834,000
Pineapples, prepared or preserved*	191,000 lb.	25,000	†	..

*Jan. 1 to June 30, 1940. †Not classified separately.

Hawaiian pineapple shipments to the United States for the 11 nonths, Jan. 1 to Nov. 30, 1940, were reported by the department f commerce as: fresh pineapple 86,787 boxes valued at $159,087. anned pineapple 392,063,573 lb. valued at $24,998,670. Pineapple uice 315,592,882 lb. valued at $16,123,029. Pineapple prepared or preserved 302,498 lb. valued at $36,020. Only very nall quantities of Hawaiian pineapple are shipped to foreign ountries. Most of Cuban pineapple exports go to the United tates and in 1940 bulk shipments were 3,705,000 lb. compared ith 1,601,000 lb. in 1939; crates 1,021 in 1940 and 1,275 in 939. Since 1925 Mexican production of pineapples has increased early 350%, practically all exports going to the United States. Iexican pineapple exports in the five years ending with 1939 veraged 41,128 short tons annually, the U.S. department of griculture reported. (S. O. R.)

Pittman, Key (1872–1940), U.S. senator from Nevada, was born in Vicksburg, Miss., Sept. 19, and reeived his education from private tutors and in the Southwestern resbyterian university at Clarksville, Tenn. He began the pracce of law in Seattle, Wash., in 1892. In 1897 he went to Alaska, orked as a miner for two years and became first district attorey of Nome, in which office he fought to protect the rights of iners. In 1901 he left Alaska and settled in Tonopah, Nev., here he practised law. He was elected to the senate in 1912 to ll an unexpired term and was re-elected five times, the last in 940. He became chairman of the committee on foreign relations 1933.

He was opposed to the participation of the United States in oreign wars, but believed that the nation should not isolate self completely from the rest of the world. As a delegate to ne London Economic conference in 1933 he obtained an agreeient for stabilizing the production and the price of silver. At ne time of his death in Reno, Nev., Nov. 10, he was president ro tem of the senate.

Pittsburgh, a city in southwestern Pennsylvania, ranked tenth among the cities of the United States in ne 1940 census, with a population of 671,659; it has an estimated rea of 54·295 sq.mi. The metropolitan district of which Pittsurgh is the centre is composed of some 130 cities or boroughs, ne next to the other, making a contiguous population of 1,954,-00.

The annual Carnegie Institute International Art exhibit in 1940 as replaced by a Survey of American Painting, with the work of most every American painter of note of the past 270 years epresented. Seven Pittsburgh artists had paintings in the conemporary section; in "retrospect," were hung the works of a umber of well-known Pittsburgh artists of earlier days: David C. Blythe, John Alexander, Chester Harding and John Kane.

The Pittsburgh Housing authority nearly completed its two low-cost housing projects in the upper Hill district; many of the houses were occupied. At Bedford Dwellings there was space for 800 families; in Terrace Village No. 1 and Terrace Village No. 2 approximately 3,000 families will find moderately priced, up-to-date housing. The project, one of the most elaborate in the country, cost $17,300,000, one-third of which paid the wages of some 1,500 workmen. Toward the close of the year the authority turned its attention to two new plans, one to house 240 families on the north side, and the second, on the south side, to house 620 families.

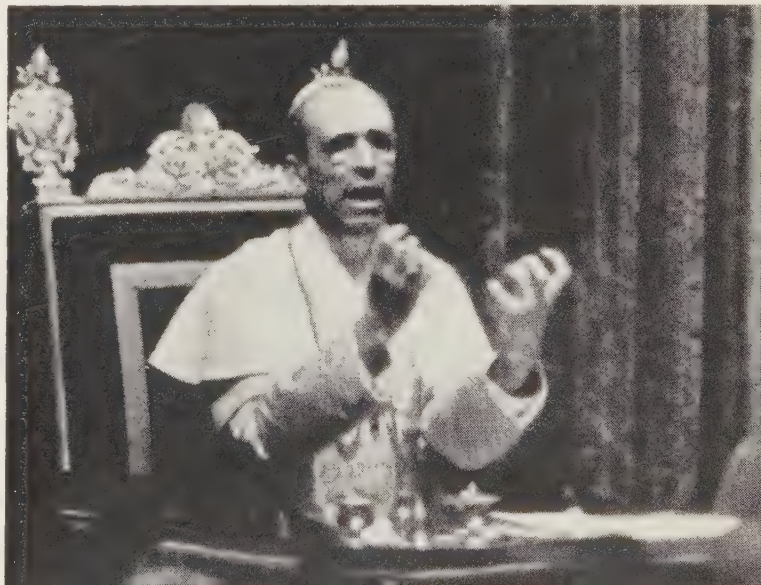
An important step in making Pittsburgh still more accessible to markets was the completion of the 160-mile super-highway to Harrisburg. The Pennsylvania turnpike, by eliminating steep grades and sharp curves, diverted a large amount of motor truck traffic to Pittsburgh that formerly avoided the Pennsylvania mountains. Within the city the Water street development, a $3,000,000 traffic by-pass, completed in 1940 along the banks of the Monongahela river, greatly lessened traffic tie-ups in the Golden Triangle. Another traffic bottleneck at the beginning of Bigelow boulevard was scheduled to be eliminated by a grade separation project begun near the close of the year.

Stimulated by the national defence program, Pittsburgh made substantial industrial gains over the marked business improvement of 1939. Industrial electric power sales and Monongahela river tonnage figures were the highest on record, and pig iron production reached the highest point since the peak year of 1929. Retail trade improved 13% over the previous year. During the first 11 months of 1940, the aggregate pay rolls of manufacturing concerns were 28·3% greater than in the first 11 months of 1939. The general business index (based on the 1923–25 average) was 117, an improvement in one year of 23·9%. (J. G. Bo.)

Pius XII (1876–) was elected the 262nd pope on March 2, 1939. Born in Rome, Eugenio Pacelli was ordained priest in 1889; entered the papal secretariat of state in 1901; was consecrated archbishop of Sardes in 1917; was named apostolic nuncio to Bavaria the same year, and nuncio to Germany in 1925; was created cardinal in 1929; became secretary of state under Pius XI in 1930.

Speaking on the first anniversary of his coronation as pope, he declared that the first year of his pontificate had seen developments sufficient to fill a whole century in the normal history of

THE FIRST MOTION PICTURE of a Pope addressing an ecclesiastical body of the Vatican, released Feb. 15, 1940, showed Pius XII discussing international peace before his advisory board in the Academy of Science



mankind. The statement was even more true for the second year of his reign. As in 1939 he strove up till the last moment to prevent the war, and as in December of that year he issued his five point program for a "just and honourable peace," so in 1940 he strove through every moral and diplomatic channel to stem the spread of the war and to promote peace.

In the course of 1940, Pope Pius made 28 appeals, on major occasions, in behalf of a just peace. These were all based on fundamental principles. In his letter to President Roosevelt, Jan. 10, he said that only those who unite high political power with a "clear understanding of the voice of humanity, along with a sincere reverence for the Divine precepts of life" will be able to "discern the path that should be followed." Addressing the cardinals on March 12, he stated: "Peace which is supported by cognizance of God . . . is the longing and wish of our soul." The following day he declared: "Peace on the indispensable basis of justice cannot be reconstructed without charity." On Easter Sunday he denounced the violation of treaties, condemned bombing of civilian populations and appealed for the restoration of right order.

His most stirring declaration was uttered on Dec. 24, when he gave the "indispensable prerequisites" for a new order: triumph over hate and renunciation of the systems and practices that promote hatred; triumph over mistrust, which renders impossible the realization of any sincere agreement; triumph over the principle that utility is the basis of law and right, for this destroys international relations; triumph over an unbalanced world economy, a triumph which would lead to granting every state the medium necessary for insuring the proper standard of living for its own citizens of every rank; triumph over the spirit of cold egoism which leads to the violation of the sovereignty of states and the liberty of their citizens.

Pope Pius linked his addresses to his appeals to God. He set aside the month of May 1940 as a period of intensive prayers for Catholics throughout the world and particularly for the children. Again, he appointed Nov. 24 as a day of public prayer throughout the world, for the intention that "peace may be restored in justice, and all peoples be united as brothers."

Directly or indirectly, many of his utterances were interpreted as denunciation of the principles motivating the axis powers. He pledged his moral support to the Low Countries and Luxembourg and consoled with France after the German invasion. On June 5, he sent a personal letter to Mussolini begging that Italy be kept out of the war. It was understood that he protested to Berlin against the persecution of Catholics in occupied Poland on Feb. 16, and it was reported that on March 11, at the audience granted von Ribbentrop, he expressed disapproval of nazi policies. His request on Dec. 3 for a truce on Christmas was not officially granted, but Germany and Great Britain both abstained from air raids.

An immense amount of relief work was accomplished by the pope in quiet ways, such as the distribution of relief in the stricken countries, assisting of refugees, securing information about missing persons in the war areas, reuniting families, obtaining help for war prisoners, etc. (*See* also ROMAN CATHOLIC CHURCH; VATICAN CITY STATE.) (F. X. T.)

Plasma: *see* CHEMOTHERAPY; MEDICINE; SURGERY.

Plastics Industry. The use of plastics was, in 1940, on the increase. Because of the war, it was impossible in 1940 to obtain even approximate figures on the volume of plastics produced in Europe, but it is well known that plastics in great variety and volume were being utilized in all of the belligerent countries.

It can be safely estimated that the 1939 world production of all plastics was upwards of 425,000,000 lb.

Production of cellulose derivative plastics in the United States during 1939 was 34,170,000 lb.

The United States production of synthetic resins, excluding alkyds, was 136,560,000 lb. The distribution of all plastics was approximately as follows:

Phenol-formaldehyde	29·0%	Vinyls	7·0%
Cellulose acetate	26·0%	Casein	5·0%
Cellulose nitrate	20·0%	Acrylic and methacrylic	2·0%
Urea-formaldehyde	11·0%	Styrene	0·30%

In 1940, much plastic material was used for military purposes, some of the applications being as follows: Cellulose acetate: transparent windows, flexible tubing, gunstocks, gas mask windows and visors, aircraft fairings, ammunition chutes in aeroplanes, and helmets. Methyl methacrylate: transparent windows for aeroplanes and gas masks. Styrene and styroflex: electrical insulation. Polyvinyl chloride (mostly in Germany): radio dials, pipes for corrosive liquids, impregnant for gas mask fabrics, and gaskets. Phenol-formaldehyde: for gas mask containers and mouth pieces, small propellers, substitute for aluminium, automobile doors, helmets and heavy-duty bearings. Doubtless there were other uses in Germany about which one can only guess.

Great Britain and Germany instituted government control over the sale and use of plastics. In the United States the government established licensing requirements for the export of opticallly clear transparents.

Cellulose acetate moulding powder and sheeting continued to replace cellulose nitrate plastics, the ratio being about three to two. Marked advances in moulding technique of both the compression and injection types contributed to the increased use of cellulose acetate and other moulding powders. Complete instrument panels could in 1940 be injected at the rate of one per minute. The use of cellulose acetate (as well as other plastics) in automobiles continued to progress, one car using plastics in 89 separate places.

A new cellulose derivative, namely cellulose acetate-butyrate, was introduced in 1940, its advantage being relative water insensitivity, causing decreased warpage. It has found application in taillight lenses, horn buttons, instrument panels with or without metal inlay, substitute for reed seating in furniture and for arch supports in shoes.

Phenol-formaldehyde, especially laminated, was used in many new places and in larger volume in old fields, such as heavy bearings, ball bearing containers, kitchen utensils, radio cabinets, window sills in railroad cars, refrigerator doors and sliding door frames and rails in large commercial refrigerators. A new development not yet ready for commercial production was that of laminated automobile trunk doors.

Styrene found use in door knobs, toilet sets, bottle closures and refrigerator fittings. Styroflex (thin oriented styrene) was used as packaging material and for electrical insulation.

Methyl methacrylate as indicated above was almost universally substituted for glass in both commercial and military aeroplanes. Other new uses are moulded toilet sets, door knobs, furniture, pipe stems, cosmetic boxes, jewellery boxes, refrigerator hardware, gasoline pump dials, cutlery handles, novelty jewellery, and display fixtures and signs.

Nylon continued to enjoy a growing market in hair brushes and tooth brushes, and found new application in industrial brushes where its great wear resistance presents a real economy.

Vinylite, a copolymer of vinyl chloride and vinyl acetate, found application as house numbers, battery separators, radio dials, bottle cap liners and raincoats. In a soft elastic form, it was used as a leather substitute for belts, also for suspenders, garters and shoe trimmings.

Vinylidene chloride, a new plastic, was used in the form of filament or strands as seats in cars and household furniture and for rope.

Cast phenol-formaldehyde in bright colours had a new lease of life as a material for automatic phonograph record players (juke boxes).

Polyvinyl butyral continued as the preferred plastic interlayer for safety glass, receiving practically universal acceptance.

Polyvinyl formal was used for tank linings and, when combined with ethyl cellulose, as an insulating wire coating.

Urea-formaldehyde was used in larger volume for lighting fixtures and in a new type of light which throws the illumination directly below the fixture but shades the eyes of one at a little distance. Very large fixtures, 26 inches in diameter, have been made. Other applications are cosmetic containers, sanitary appliances, refrigerator door linings and plywood adhesives.

Finally it may be said that the consuming public became increasingly plastic-minded in 1940 even though about 50% of plastic production went into industrial uses where it was not always evident to the consumer. Such uses were machine parts, factory and electrical equipment. (*See* also CHEMISTRY, APPLIED; DENTISTRY; INDUSTRIAL RESEARCH; PAINTS AND VARNISHES; RAYON; RUBBER AND RUBBER MANUFACTURE; TEXTILE INDUSTRY.) (H. W. PA.)

Platinum. No data have been published on the Russian platinum output since 1926, and data on exports

re incomplete; since these figures vary widely from year to year, he world totals fluctuate accordingly, and do not represent a true icture of the industry, as it is not known how much of the Rusian shipments is from current production and how much from ccumulated surplus stocks from previous years. The world supply n 1938 is estimated to have been almost 400,000 oz.

From 12,500 oz. in 1929, the Canadian production increased to 61,300 oz. in 1938, dropping to 148,900 oz. in 1939. The next argest producer is Colombia, with an output which dropped in he past few years from 55,000 oz. (crude) to less than 30,000 oz. n 1937, but recovered to 39,100 oz. in 1939. The fourth largest roducer is South Africa, which had a high figure of 45,500 oz. n 1930, dropped heavily, but rose to 47,100 oz. in 1939. The Jnited States output stands fifth in the list, the yield since 1935 aving been boosted above the previous level by a new placer eposit in Alaska. In 1939 the recovery of by-product platinum vas 5,270 oz. and of placer crude 35,060 oz., the exact platinum ontent of which is unknown. (G. A. Ro.)

Plums and Prunes. The 1940 prune crop varied widely in the five states of principal production, the United States department of agriculture reported. In California and Michigan, where plums are grown chiefly for fresh use, the crop was 2% under average, while in Idaho it was 6% below average. Eastern Washington and western Oregon reported production above average while in the more important areas of western Washington and western Oregon, where plums are grown mostly for drying, the yield was extremely light. In Yugoslavia, foremost European producer, 1940 production was estimated at 13,000 short tons compared with 80,300 tons in 1939, owing to winter killing of trees. United States production and use in 1940, in 1939 and for the ten-year (1929–38) average, as reported by the department of agriculture, are shown in Tables I and II.

Table I.—*Quantities of Plums used Fresh, Canned and Dried*

State	1940	1939	1929–38
Used Fresh, in Tons, Fresh Basis			
Idaho	22,000	22,300	17,400
Oregon	17,000	20,100	16,960
Washington	10,200	15,800	14,210
Total, three states	49,200	58,200	48,570
Canned, in Tons, Fresh Basis*			
Oregon	10,700	25,700	14,450
Washington	5,100	6,800	4,540
Total, two states	15,800	32,500	18,990
Dried, in Tons, Dry Basis†			
California	196,000‡	185,000	198,900
Oregon	2,600	26,600	24,090
Washington	100	1,800	3,450
Total, three states	198,700	213,400	226,440

*Includes small quantities for cold packing. †The drying ratio in Washington and Oregon ranges from 3 to 4 lb. of fresh fruit to 1 lb. dried; in California the drying ratio is approximately 2½ lb. of fresh fruit to 1 lb. dried. ‡In addition 1,000 tons (dry basis) were not harvested because of market conditions.

Table II.—*Plum Production in U.S. in Tons, Fresh Basis*

State	1940	1939	1929–38
California	70,000	71,000	61,500
Western Oregon	26,000	140,000	100,700
Eastern Oregon	16,400	13,800	12,880
Idaho	22,000	23,500	17,960
Eastern Washington	14,400	14,300	13,250
Western Washington	2,800	20,000	19,800
Michigan	5,800	6,300	5,390
Total	157,400	288,900	231,480

(S. O. R.)

Pneumonia. In 1940 the chemotherapy of pneumonia continued to be the outstanding topic. The remarkable therapeutic effect of sulphapyridine in the treatment of the various types of pneumococcal pneumonia was corroborated. Sulphapyridine has revolutionized the treatment of pneumonia. Perrin Long points out that while serum reduced the death rate of pneumonia by approximately 50%, sulphapyridine has reduced it by 75% or 80%. Whereas it was formerly expected to lose one out of every three patients with pneumonia, it was expected in 1940 to lose not more than one out of every 14 or 15 cases.

Because of certain toxic symptoms referable to sulphapyridine, chemists have been striving to produce a modification of the drug which would possess all of its therapeutic advantages without the toxic disadvantages. A close approach to this desideratum was found in sulphathiazole. Sulphapyridine not only causes nausea and vomiting in many patients, but also produces mental depression and sometimes a grave effect on the white or red corpuscles in the blood. Occasionally sulphapyridine produces crystalline precipitates in the urinary tract which form small stony concretions and excite acute inflammation in the kidneys and bladder. Sulphathiazole is distinctly less toxic than sulphapyridine, but just as effective in combatting pneumococcus infections. For example Rake and his co-workers showed that in rats, sulphapyridine is twice as toxic as sulphathiazole; furthermore, in monkeys receiving daily doses, sulphapyridine is more toxic than sulphathiazole as shown by damage in the urinary tract and by loss of weight and decrease in the number of leukocytes. All authorities agreed that nausea and vomiting are much less frequent with sulphathiazole than with sulphapyridine.

Sulphathiazole is absorbed more rapidly than sulphapyridine from the gastrointestinal tract, and is excreted more rapidly and completely in the urine.

Furthermore it was generally agreed that the reduction in death rate is almost identical with the two drugs. The sudden drop in temperature which occurs within 24 hours in a large proportion of the sulphapyridine cases is not quite so striking in the case of sulphathiazole.

Another sulphonamide derivative has been introduced—sulphadiazine. This agent has a powerful inhibitory effect on not only the pneumococcus and streptococcus, but on the staphylococcus and Friedlander bacillus as well. Sulphadiazine had not yet in 1940 been released for general use by the medical profession, but experience already obtained in several large university hospitals seems to indicate that sulphadiazine is even less toxic than sulphathiazole and at the same time has a wider range of germicidal effect.

Chemotherapy.—Remarkably few deaths were reported from the use of chemotherapeutic agents in the treatment of pneumonia. Undoubtedly from time to time a fatal reaction will be reported in some person who is hypersensitive to the drug. (*See* also CHEMOTHERAPY; EPIDEMICS AND PUBLIC HEALTH CONTROL; MEDICINE.)

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(R. L. C.)

Poetry: *see* AMERICAN LITERATURE; CANADIAN LITERATURE; ENGLISH LITERATURE; FRENCH LITERATURE; LITERARY PRIZES; PUBLISHING; SPANISH-AMERICAN LITERATURE.

Poison Gas: *see* CHEMICAL WARFARE; MUNITIONS OF WAR.

Poland. The area of Poland prior to the German invasion on Sept. 1, 1939 was about 150,820 sq.mi.; the population was estimated Jan. 1, 1939 as 34,900,000. On Sept. 29, 1939, after the conquest of the country was virtually completed, Germany and the U.S.S.R. partitioned Poland and set up a new

JEWS IN GERMAN-OCCUPIED POLAND must wear yellow triangles sewed on the backs of their coats as marks of identity

boundary which, running from north to south, roughly follows the Pissa, Bug and San rivers. The Germans then divided their territory into two sections; one, including the provinces of Pomorze, Posen, Upper Silesia and Lodz, was directly annexed to the Reich; the rest was constituted as the Gouvernement General of Poland, under German administration, with Cracow as the capital.

History.—During 1940 a welter of rumour issued from the German- and Russian-occupied sections of Poland, which was cut off from free communication with the outside world. The Allied governments repeatedly charged gross maltreatment of Polish civilians at the hands of both Russians and Germans, as did the Polish government-in-exile (in its *Black Book* published at Paris April 17, 1940), the Roman Catholic church, and various Jewish organizations. Many of these charges were authenticated. That there was widespread misery and hunger in the former republic was scarcely deniable.

From Berlin itself came official announcements which indicated that the nazis intended to suppress all Polish national life indefinitely. On Jan. 8, 1940 the first of numerous German-language schools was opened in the Gouvernement General. Two weeks later Governor General Hans Frank ordered all Poles to give up their radio sets and extended the labour conscription laws to include youths between 14 and 18 years of age. Confiscation of factories, forests and farmlands in former Polish territory (except the Gouvernement General) was decreed by Goering on Feb. 19, and in August the Reich council of ministers imposed a "social equalization tax" of 15% on the incomes of all Poles, in addition to the already-existing German income tax. Dispatches passed by the German censor told of scores of thousands of Polish agricultural labourers—5,000 daily from Warsaw alone—being brought to Germany to work German farmlands. In December Berlin announced that most Polish prisoners of war had been released but were engaged in civil employment.

News from Russian-held Poland was scarcer, but there were several reports that whole blocks of Polish populations had been transplanted to Siberia and Kazakh S.S.R. The Catholic church charged that religion was suppressed in Russian Poland.

The Government-in-Exile.—Fleeing before the German advance into France, Poland's exiled government vacated its provisional capital at Angers in June and moved to Bordeaux, then London. On Aug. 5 Premier Wladislaw Sikorski signed a military agreement with Great Britain for a joint prosecution of the war. On Oct. 9 Wladislaw Raczkiewicz, the Polish president in exile, signed an agreement with Eduard Beneš, expatriate president of Czechoslovakia, pledging mutual support and friendship.

Polar Regions: *see* EXPLORATION AND DISCOVERY.
Pole Vaulting: *see* TRACK AND FIELD SPORTS.

Police. The turn of the decade found police forces everywhere revising their patterns in order to adapt themselves to war. In many parts of Europe and Asia, police were virtually absorbed into the military establishments and became integral parts of national defence. Much the same was true, though to a lesser extent, of Great Britain, Australia and Canada. Even in the neutral nations of North America, the advent of 1940 saw either a tightening of central controls over police, or major changes in interforce relationships. The police of England, Wales and Scotland, heavily engaged in "air raid precautions" found themselves burdened with still further responsibilities in assisting their civil populations to meet unrestricted air warfare in non-military zones. The threat of invasion also required large-scale planning of new civil defence arrangements, while the nightly black-outs produced crime and accident hazards of a kind never before experienced. Canada, far removed from the theatre of war, nevertheless took anticipatory action intended to facilitate the mobilization of police at points threatened by civil disorder or thrown into confusion by military conflict. In the United States similar steps were taken. New York, New Jersey, Virginia and Connecticut adopted state-wide programs for mobilizing police. As the year closed, it appeared probable that other states, with police systems no less decentralized, would also act to assure an orderly transfer of police strength to any threatened point. These departures were significant because they were initiated by the governors without legislative action and were realized only because of the ready acquiescence of the local police concerned. Thus a wholly novel type of central control over police operations in emergencies was created.

There were no important changes in the numerical strength of municipal police forces. Latest figures (for 1939) covering 2,750 cities, towns and villages, are summarized from the *Uniform Crime Reports* in Table I. Latest available data on costs of

Table I.—*Numerical Strength of Municipal Police in U.S.*

Population Groups of Cities	Number of Forces Filing Returns	Population Represented	Number of Police per Thousand of Population
Group I—over 250,000	37	29,695,500	2.19
Group II—100,000 to 250,000	57	7,850,312	1.47
Group III—50,000 to 100,000	103	6,893,474	1.36
Group IV—25,000 to 50,000	191	6,650,168	1.21
Group V—10,000 to 25,000	568	8,765,546	1.08
Group VI—Under 10,000	1,794	8,837,885	1.11
Totals	2,750	68,692,885	1.65

operation and maintenance (1937) for police in cities over 100,000 population (Table II) showed a substantial increase over the preceding year. A new high level for the depression cycle was thereby reached and one which approached closely to the all-time high recorded early in the decade. There were numerous indications between 1938 and 1940 that the all-time record of per capita expenditure for police had been exceeded. Crime cleared by arrest in 1939 showed a slight falling off in this form of police efficiency, as measured against the peak year of 1938 in such major crimes as murder, aggravated assault and robbery. As usual, police cleared more crimes against the person, ranging from 87·4% (for murder and non-negligent manslaughter) down to 76·5% (for aggravated assault). Arrest clearances of crimes against property again reflected a less favourable situation than in the case of crimes against the person, ranging from 24·4% for

Table II.—*Per Capita Cost of Operation and Maintenance Charges for Municipal Police, 1933–37, in U.S.*

Population Groups of Cities	Per Capita Cost of Police				
	1937	1936	1935	1934	1933
Group I—All cities over 500,000	6.34	6.06	5.84	5.65	5.69
Group II—All cities 300,000 to 500,000	4.11	3.71	3.65	3.60	3.79
Group III—All cities 100,000 to 300,000	3.05	2.83	2.71	2.66	2.69

auto theft (an increase from 22·3% in 1938) up to 41·9% for robbery. Table III summarizes the record of crimes cleared in 1939, in 1,214 cities having a total population of 39,147,097. There was a percentage decline from 1938 in clearances for all crimes except negligent manslaughter and auto theft.

Table III.—*Per Cent of Crimes Cleared by Arrest, in U.S. Cities, 1939*

Murder and Non-Negligent Manslaughter	Negligent Manslaughter	Rape	Robbery	Aggravated Assault	Burglary, Breaking or Entering	Larceny, Theft	Auto Theft
87.4	87.7	81.8	41.9	76.5	34.0	25.1	24.4

With the establishment of rudimentary state forces in Florida and Wisconsin, every state in the union was supporting a state police body of some description.

An important change in federal police organization occurred when President Roosevelt by executive order transferred the immigration border patrol from the department of labor, with which it previously had been articulated, to the department of justice. Some professed to see evidence of a trend towards consolidating others of the far-flung and highly varied federal police systems under the administrative direction and control of the attorney-general.

Largest single development in federal police jurisdiction was the addition of several hundred men to the numerical strength of the federal bureau of investigation. Announced purpose was to make it possible for the FBI to enlarge the scope of its investigations into sabotage, espionage and subversive activities, especially delegated to them by executive order of the president.

England and Wales.—The rise in the numerical strength and gross expenditures of the police forces, previously noted for each year since 1934–35, was continued during the year 1938–39, as shown in Table IV. Increasing emphasis on police resources as a measure of national defence was responsible for much of the increase, though the reports of His Majesty's inspectors of constabulary for the year ended Sept. 29, 1939, expressed regret that it was not until the outbreak of hostilities on Sept. 1 of that year that many local authorities accepted the fact that grave dangers impended. Many chief constables stated that the closing of the schools and the difficulties occasioned by evacuation tended to increase juvenile crime, though there was nothing in 1940 to indicate that the problem was a serious one. The war also impeded the construction of new police buildings, and in some instances training programs were curtailed. The latter was viewed with some concern, lest war conditions ultimately would impair the effectiveness of police through neglect of methods and procedures of established value.

A decline in the numerical strength of the police of the metropolitan police district, previously noted for 1937–38, was further extended into 1938–39, with the average daily strength dropping by about 1% to 18,428. Thus the London metropolitan police shared with New York city in 1940 the distinction of being the world's largest local police force.

Table IV.—*Numerical Strength and Gross Expenditures; Police Forces of England and Wales, 1939–35*

	Numerical Strength	Gross Expenditure
1938–1939	63,594	£25,849,470
1937–1938	62,804	25,096,020
1936–1937	60,966	23,497,839
1935–1936	60,257	22,751,377
1934–1935	59,988	22,785,323

There was a considerable increase in the use of wireless communication to patrol cars, with resulting improvements in police service.

Activities of the I.R.A. (Irish Republican army) in the Midlands greatly increased the burden of repressive activity for the police.

Another dislocation caused by the war was occasioned by police officers and constables being called to the colours. In addition to these necessary replacements, a police war reserve was set up, though difficulties were being experienced in recruiting suitable men for it in industrial areas where high wages were in effect. There seemed to be no promise that this situation would be improved in the near future; rather the prospect was that it would be aggravated.

General.—The clash of arms was not conducive to international conferences on police techniques. However, the International Association of Chiefs of Police (in which U.S. and Canadian memberships heavily predominate) held its 47th Annual Police congress at Milwaukee in Sept. 1940. Greatest interest was centred upon the possible future status of local and state police pension funds under pending amendments to the (U.S.) Social Security act. These would include police among the groups subject to compulsory insurance. Various measures were adopted to assure that the viewpoint and interests of police were adequately presented in the event that any such amendments actually moved towards enactment. Another matter eliciting much discussion at the police congress was the possible effect of the (U.S.) Selective Service act of 1940 in diverting trained police into active military service.

At a civil defence conference held in Washington Nov. 15–16, 1940 under the general auspices of the International Association of Chiefs of Police, the state-wide police mobilization plans initiated in four of the eastern states were commended to the attention of state and local governmental executives in other parts of the union. Formal request was also made to the government of the United States for financial aid to states, counties, towns, cities and villages in adding to their resources of police man power and equipment. Thus state and local police administrators, heretofore opposed to federal intervention in local police affairs, invited an enlargement of federal administrative controls.

Largest single development in police techniques was the adaptation of radio frequency modulation to police broadcasts. Indications were that with extension of the new facilities radio telephone communication between police stations and patrol cars, often difficult to conduct on a satisfactory basis in congested areas, would be materially improved. (*See* also CRIME; CRIME DETECTION; FEDERAL BUREAU OF INVESTIGATION.)

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Poliomyelitis: *see* INFANTILE PARALYSIS.

Political Parties, U.S.: *see* COMMUNIST PARTY; DEMOCRATIC PARTY; ELECTIONS; REPUBLICAN PARTY; SOCIALIST PARTY.

Polo. The National Open championship, most important event of the U.S. season, was won by the Aknusti team of Gerard Smith, Robert L. Gerry, Jr., Elbridge T. Gerry and Alan L. Corey, Jr. Great Neck, runner-up in the open, came back to defeat Aknusti in the Waterbury Cup final, most important handicap event of the year. Great Neck played with George H.

Mead, Jr., J. Peter Grace, Jr., S. B. Iglehart and Robert E. Strawbridge, Jr. Iglehart's Great Neck team also won the National Twenty Goal, although Gerald Dempsey and E. N. Carpenter played in place of Mead and Strawbridge in this event.

The year's Inter-Circuit and Twelve Goal championships were played in Cleveland, the former event being won by the Blue Hill Farms team of Philadelphia while the National Twelve Goal was won by the Gates Mills team of Ohio. The National Intercollegiate championship was won by Yale university.

Because of the war, there were no international matches played during 1940, but there were many charity matches played throughout the country for the Red Cross and other war relief causes and these were enthusiastically received by press and public alike.

Elbridge T. Gerry became the new chairman of the United States Polo association, governing body of the game, replacing Robert E. Strawbridge, Jr. (R. F. K.)

Poore, Benjamin Andrew (1863–1940), U.S. soldier, was born in Centre, Ala., June 22, and was graduated from the United States Military academy in 1886, from the Infantry and Cavalry school in 1893 and from the Army War college in 1909. He rose through various grades until he reached the rank of major general in 1925. He saw service in the Philippines and in China and served in the World War of 1914–18, participating in the Aisne-Marne, St. Mihiel and Argonne offensives of 1918. He retired in 1927. He had received the U.S. Distinguished Service medal and Distinguished Service cross, the French Croix de Guerre with palms, and the Italian Croce di Guerra al Merito. He died in Fitchburg, Mass., Aug. 27.

Population, Movements of: *see* CENSUS, 1940; REFUGEES.
Populations of the Countries of the World: *see* AREAS AND POPULATIONS OF THE COUNTRIES OF THE WORLD.
Pork: *see* MEAT.

Portal, Sir Charles Frederick Algernon (1893–) was appointed early in Oct. 1940 to succeed Sir Cyril L. N. Newall as chief of the British royal air force. He was educated at Oxford and after a brief period as a motorcycle racer joined the British army during the World War of 1914–18 as a dispatch rider. Finding these duties none too exciting, he joined the air force and advanced to the rank of colonel. After the armistice he stayed with the force and in 1937 became director of organization for the air ministry. After the outbreak of war in 1939 he was appointed head of the bomber command and thus directed the series of raids against nazi bases in France, Norway, Belgium and Holland which probably forestalled the expected invasion of Britain by Germany in 1940. His excellent planning and execution of raids led to his appointment Oct. 4, 1940 as chief of the air staff.

Porto Rico: *see* PUERTO RICO.

Portugal, a republic of western Europe, forming part of the Iberian peninsula and bounded on the N. and E. by Spain and on the S. and W. by the Atlantic ocean. Area (including Azores and Madeira) 35,670 sq.mi.; pop. (est. Dec. 31, 1938) 7,460,000. Chief towns: Lisbon (cap. 594,300); Oporto (232,280). President: Gen. Antonio Carmona; language: Portuguese; religion: Christian (mainly Roman Catholic).

History.—Interest during 1940 centred around the celebrations of Portugal's double centenary (1140: foundation of Portugal as an independent nation; 1640: recovery of national independence), at the chief functions of which Great Britain was represented by H.R.H. the duke of Kent. Inaugurated in Lisbon on June 2, held in every town and village throughout the country and brought to a close on Dec. 2, they were shorn of some of their brilliance and animation by the European war, which in particular prevented many foreign delegates from attending the Congress of the Portuguese World, held at Lisbon, Coimbra and Oporto during July.

BOYS OF THE PORTUGUESE "MOCIDADE" youth legion drilling in 1940. Membership for boys between 10 and 14 is compulsory

For the 12th successive year the national budget was balanced. The new estimates provided for the influence of war conditions, notably for a diminution in import duties, but in most respects it was hoped that prewar levels would be maintained. The government decreed the optional conversion of the external debt, amounting to a total sum of about £27,000,000 sterling.

On May 7 a concordat was signed between Portugal and the Holy See, providing, among other things, for the restitution of sequestrated church property, the establishment of religious instruction in schools and the indissolubility of the marriage bond. Bishops were to be appointed by the Holy See, but only after its previous consultation with the government. The church might freely practise religious acts both in private and in public.

As one result of the concordat, the Portuguese diplomatic mission at the Vatican was raised to an embassy. Dr. Carneiro Pacheco, minister of education, being appointed first ambassador. This appointment led to various cabinet readjustments, the prime minister, however, retaining the portfolios of war and foreign affairs.

The continued cordiality of Portugal's relations with Spain was symbolized in a number of visits on either side and given further expression by the issue, in May 1940, of a joint declaration of mutual confidence; by the signing in July of a protocol to the Spanish-Portuguese treaty of March 1939; and by the Anglo-Spanish-Portuguese agreement (July 24) facilitating the purchase of Portuguese and colonial goods by Spain through the Anglo-Spanish clearing office. (E. A. P.)

Education.—Elementary (1937) schools 7,890; scholars 734,922; secondary (1936–37) schools 45; scholars 18,055; universities (1936–37) 3; students 5,871.

Banking and Finance.—Revenue, ordinary (est. 1939) 2,029,200,000 escudos; expenditure, ordinary (est. 1939) 2,019,800,000 escudos; public debt (1938) 7,229,300,000 escudos; notes in circulation (Aug. 31, 1939) 2,230,000,000 escudos; gold reserve

(Aug. 31, 1939) 920,000,000 escudos; exchange rate: 110 escudos =£1 sterling.

Trade and Communications.—External trade (merchandise): imports (1938) 2,284,337,000 escudos; (Jan.-Aug. 1939) 1,275,720,000 escudos; exports (1938) 1,140,943,000 escudos; (Jan.-Aug. 1939) 786,770,000 escudos; re-exports (1938) 412,436,000 escudos. Communications and transport (Dec. 31, 1937): roads, first and second class 8,858 mi.; railways, open to traffic 2,187 mi.; motor vehicles licensed: cars 34,442; commercial 11,410; cycles 4,536; shipping (June 30, 1938) 261,100 gross tons; launched (July 1938–June 1939) 2,100 gross tons.

Agriculture and Minerals.—Production 1938 (in metric tons): wheat 430,100; maize 296,200; wine 10,955,000 hectolitres; coal 308,000; rye 102,900; oats 94,800; rice (1937) 84,900; barley 39,000; potatoes (1937) 596,100; olive oil 36,000; sea fisheries 224,400.

Portuguese Colonial Empire.

Total area (approx.) 839,506 sq.mi.; total population (est. Dec. 31, 1937) 16,790,000. Certain essential statistics of the colonial possessions of Portugal, including the mother country itself, are given in the table.

History.—President Carmona's 1939 colonial tours, together with the rapid reconstruction going on in the colonies, were bringing the empire into the limelight at home. Part of the general Congress of the Portuguese World held in July (*see* PORTUGAL) took the form of a self-contained colonial congress, to discuss Portuguese colonial problems, including those of research in anthropology, medicine, etc., colonization, population (especially in Angola and Mozambique) and economic life. The transactions of the congress were in 1940 being published in two volumes.

In each of the colonies, during 1940, financial equilibrium was maintained. Mozambique, in which for the first time an income tax was to be levied, was particularly prosperous. All the colonies were to pay a special defence tax; large allocations were also being made for road works and other development schemes. General Tristão de Bettencourt, a distinguished colonial expert, was appointed governor general of Mozambique.

The Patronage of the East, placed in jeopardy by the Separation law of 1911, was fully restored and consolidated in the concordat of May 1940.

A full census of the Portuguese empire was to be taken for the first time during 1940. (E. A. P.)

Portuguese East Africa: *see* PORTUGUESE COLONIAL EMPIRE.
Portuguese Guinea: *see* PORTUGUESE COLONIAL EMPIRE.
Portuguese West Africa: *see* PORTUGUESE COLONIAL EMPIRE.

Post Office.

The audited revenues of the post office department for the fiscal year ended June 30, 1940, amounted to $766,948,626.74, which was the largest in the history of the service, exceeding by $20,993,551.50 the previous banner year of 1939, an increase of 2·82%.

The audited expenditures for the department during the fiscal year of 1940 were $807,732,865.48, leaving a gross deficit which included various non-postal items such as franked mail, air mail subsidy, penalty mail and publications free in county, of $40,784,238.74. Deducting all these non-postal items which totalled $59,393,274.75, as authorized by act of June 9, 1930, left a net postal surplus for services rendered for hire of $18,609,036.01. This was the sixth net postal surplus during the past seven years.

In addition to its customary functions the post office department performed many other important public duties, including the sale of United States savings bonds, which during the fiscal year ended June 30, 1940, amounted to $847,180,000.00.

Air Mail.—At the end of the fiscal year 1940, the aggregate length of all domestic air mail routes was 37,943 mi., an increase of 894 mi. during the year. A total of 18,671,367,440 pound-miles of air mail service were performed as compared with 15,818,617,372 pound-miles during the fiscal year 1939. The pre-audit estimate of air mail postage revenue for the fiscal year 1940 is $19,100,000, an increase of 16·38% over the previous year.

Portuguese Colonial Empire

Country & Area sq. mi. (approx.)	Population est. Dec. 31, 1937 (000's omitted)	Capital, Status, Governors, Premiers, etc.	Principal Products (in metric tons)	Imports & Exports 1937 (in thousand escudos)	Road, Rail, & Shipping 1937	Revenue and Expenditure est. 1938 (in thousand escudos)
Portugal (including the Azores and Madeira) 35,670	7,380	Lisbon, republic, *President:* General António Carmona. *Premier:* Dr. António Salazar.				
AFRICA Angola (Portuguese West Africa) 481,351	3,250	Luanda, colony, *Governor-General:* Manuel de Cunha e Costa Marques Mano.	(1937–38) maize 260,500 cane sugar 32,500	imp. 214,897 exp. 343,773	rds. 21,388mi. rly. 1,434mi. shpg. (1936) entered, 5,330,087 tons	(est. 1939) rev. and exp. 255,990
Cape Verde Is. 1,546	166	Praia, colony, *governor:* Amadeu Gomeo de Figueiredo.	(export 1937) salt 29,843 preserved fish 325	(1936) imp. 63,583 exp. 2,845	rds. 493mi. shpg. (1936) entered, 4,508,196 tons.	(est. 1939) rev. and exp. 19,452
Portuguese Guinea 13,946	420	Bolama, colony, *governor:* Luiz António de Carvalho Viegas.	(export 1938) ground-nuts 31,500; palm and palm kernel oil, 6,900	imp. 36,642 exp. 38,535	rds. 1,714mi. shpg. (1936) cleared, 159,761 tons.	(est. 1939) rev. and exp. 30,395
São Tomé and Principe Is. 386	60	S. Tomé, colony, *governor:* Ricardo Vaz Monteiro.	cacao, coffee, coco-nut	imp. 20,522 exp. 46,446	rds. 169mi. rly. 10mi. shpg. entered, 868,539 tons.	rev. and exp. 12,296
Mozambique (Portuguese East Africa) 297,729	4,280	Lourenço-Marques, colony, *governor-general:* General Tristão de Bettencourt	cane sugar (1936–37) 115,100; ground-nuts (1937) 37,600.	imp. 432,769 exp. 365,257	rds. 17,970mi. rly. 1,130mi. shpg. (Beira) cleared, 4,148,118 tons.	rev. and exp. 589,383
ASIA Portuguese India 1,538	600	Nova Gôa, colony, *governor-general:* José Cabral.	fish, spices, salt.	(1936) imp. 111,543 exp. 20,508	rds. 730mi.; rly. 51mi.; (1936) shpg. entered, 2,687 vessels.	rev. and exp. 52,612
Macao 8	170	Macao, colony, *governor:* Dr. A. T. Barbosa.	fish, cement, preserves	(1936) imp. 108,158 exp. 62,818	shpg. cleared, 2,298,285 tons.	rev. and exp. 38,746
Timor 7,332	464	Dili, colony, *governor:* Alváro Eugênio Neves de Fontoura.	coffee, sandalwood, wax.	(1936) imp. 3,413 exp. 7,550	rds. 496mi. (1936) shpg. entered, 221 vessels.	rev. and exp. 13,411

"THE BRITISH ARE COMING!" by Russell of the *Los Angeles Times*, illustrates the sharp protests of the U.S. department of state in Jan. 1940 over British seizures of American mail destined for central Europe

Within the fiscal year service was inaugurated on two new domestic routes as follows: Route 44, between the terminal point Kansas City, Mo., the intermediate point Chicago, Ill., and the coterminal points Newark, N.J. and New York, N.Y., and between the terminal point Kansas City, Mo., the intermediate point Chicago, Ill. and the terminal point Pittsburgh, Pa.; Route 45, between the terminal point Saint Paul-Minneapolis, Minn., and the terminal point Duluth, Minn.-Superior, Wis.

There was a substantial increase over the year 1939 in the amount of air mails transported over foreign routes, amounting to 78·4% in mails dispatched and 75·7% in mails received. This increase in air mail, which included the mail carried on the transatlantic route, was largely accounted for by this one route. The mail dispatched on other routes increased 32·2%; the mail received increased 16·4%.

There were (Jan. 1, 1941) 45,331·4 route miles embraced in the foreign air mail service, over which 5,907,124·5 miles were flown during the fiscal year.

During the year the transatlantic air mail service was increased to three trips a week, all of which were on the southern route, between New York and Lisbon. Service once every two weeks was inaugurated July 12, 1940 on a new route in the South Pacific from San Francisco to Auckland, New Zealand by way of Los Angeles, Honolulu, Canton island and Noumea, New Caledonia. Twice-a-week service between Seattle, Wash. and Juneau, Alaska was started on June 20, 1940.

The United States foreign air mail system served directly 81 cities in the following places: Canada, Europe, Cuba, Mexico, Central and South America, Hawaii, Asia, New Caledonia, New Zealand, as well as Alaska, the Philippine islands, Canton island, Puerto Rico, the Canal Zone and Guam. During 1940 Shediac, Moncton, Foynes, Southampton and Marseilles ceased to receive direct service on the transatlantic service. Montevideo, Uruguay, was suspended as a stop in the South American service.

Buildings.—During the fiscal year 1940, 204 new and additional federal buildings were occupied, 11 extensions to existing buildings were completed, and 14 new federal buildings replaced a like number of old buildings which had become inadequate for government purpose.

Nearly 400,000 people earned their living in the postal service in 1940, of which more than 268,175 were regularly employed. Frank C. Walker, of Pennsylvania, was appointed postmaster general Aug. 31, 1940. (J. W. Co.)

Great Britain.—As in the case of so many other British business activities, it was impossible in 1940—the second year of the war—to assemble precise statistics. Increases in postal, telephonic and telegraphic charges were announced in the April 1940 budget, which in a full year were estimated to bring in an additional £11,400,000. A certain amount of dislocation occurred as a consequence of the intense air war of the second half of 1940; and some aspects of the resultant delays were the subject of criticism in the press and in business circles, but the post office authorities, maintaining the well-deserved reputation of their department for efficiency, promptly took steps to rectify those causes of delay which were under their control. There was a continual and expected decline in the volume of postal traffic—due partly to the increased charges and partly to the restriction of advertising circular distribution and the almost total elimination of football-pool business—but actual receipts fully justified expectations.

In the first few weeks of 1940 interference was caused by I.R.A. bombings in London, Liverpool, Manchester and other centres, especially to mails at railway stations and in pillar-boxes; but strong measures were taken, and nothing was heard of these after March. By this time events on the continent were seriously impairing overseas communication, the difficulties of which were vastly increased by the fall of France and by the closing of the Mediterranean following the Italian entry upon the war arena in June, which led, *inter alia,* to the temporary suspension of the empire air services. These were later resumed to a limited extent, mails being carried by sea to South African ports for transmission by air to India, Australasia and the far east, while for the Americas, and also for New Zealand and Australia, the "Clipper" service via Lisbon was used. Important diplomatic documents, mails and freight were also carried on the ten crossings from Ireland to Newfoundland by the British flying boats "Clare" and "Clyde."

Penny postage was introduced into Great Britain on Jan. 10, 1840, and to commemorate the centenary the Postal Historical society held a dinner on that date in 1940, and in May special stamps (½*d.*, 1*d.*, 1½*d.*, 2*d.* and 2½*d.*) bearing the heads of Queen Victoria and King George VI were issued, and a very successful exhibition, under the auspices of the Royal Philatelic society, was opened by the duke of Gloucester. (*See* PHILATELY.)

(L. H. D.)

Potash. The crude potassium salts output of the world is almost exclusively the chloride or sulphate, with a small proportion of nitrate and carbonate, produced primarily for fertilizer use; only a very small amount goes into industrial chemicals, and even in the United States, where the industrial demand is probably higher than in any other country, with the possible exception of Germany, the chemical salts comprise only about 10% of the total. World production decreased from 2,800,000 metric tons of K_2O equivalent in 1929 to 1,400,000 tons in 1932, increasing to 3,105,000 tons in 1938, distributed as follows: Germany 60%, France 19%, United States 9%, soviet union 9%, and Poland 2%; the remaining 1% comes from Palestine, Spain and several still smaller sources.

The production of potash in the United States was a World War development that has been growing steadily since the postwar slump. In 1929, five plants produced 61,590 short tons of K_2O

equivalent and expansion continued throughout the depression with practically no break; ten plants produced 192,800 tons in 1935 and six plants turned out 307,051 tons in 1939. In spite of this heavy increase in production the demand far exceeded the supply and imports increased to 243,600 tons in 1935 and 319,700 tons in 1937, but decreased to 193,600 tons in 1938 and 97,900 tons in 1939. Sales of potash salts in the United States in 1939 amounted to 861,400 short tons, equivalent to 464,200 tons of K_2O. (*See* also FERTILIZERS.) (G. A. Ro.)

Potatoes. Surplus crop conditions were created in the United States by the 1940 production of potatoes, estimated Dec. 1 by the department of agriculture as 397,722,000 bu. The 1939 crop was 363,159,000 bu. The ten-year (1929–38) average was 366,949,000 bu. The yield of 130·3 bu. per acre was the highest on record and compared with 120·3 bu. in 1939 and a 10-year average of 111·5 bu. Potato consumption in the United States has declined steadily since 1900, concurrent with a steady increase in the consumption of fresh and canned vegetables. In the face of declining consumption and the surplus 1940 crop the federal Surplus Marketing administration adopted various measures to relieve the surplus and support the market. The Surplus Marketing administration is a new governmental agency, created in 1940 by merging the marketing division of the Agricultural Adjustment administration with the federal Surplus Commodity corporation. The SMA revived the plan of 1937–38 when the government diverted 3,680,000 bu. of a surplus potato crop to the manufacture of starch in Maine, which is the centre of the potato starch industry. The SMA authorized federal payments of 14½ cents per bu. (60 lb. to the bushel) for 1940-crop potatoes diverted to starch manufacture. Up to Sept. 14 the SMA had bought 1,500,000 bu. of potatoes of the 1940 crop for relief distribution and subsequently made purchases of hundreds of cars for the same purpose. In addition, potatoes were put on the surplus commodity lists of 150 cities where relief foods are distributed according to the government's stamp plan to encourage consumption of surplus products. Potatoes were also put on the menu of free lunches given to needy school children. An average of 1,200,000 children received such lunches in 1939 and it was announced by government sources that an effort would be made to serve 6,000,000 in 1940.

While no official figures were forthcoming from many governments the U.S. department of agriculture received information that central Europe had a good potato crop in 1940. Except in Belgium and France, where the crop was much below average owing to neglect of farming during the first months of invasion, there was no scarcity of potatoes, which were one of the foods sufficiently plentiful in Germany as not to require rationing. Before the European war annual production of potatoes in continental Europe (Russia excluded) averaged 142,000,000 metric tons, with consumption averaging 126,400,000 metric tons annually. The table shows production in the United States in 1940 and 1939 by states. (*See* also SWEET POTATOES.) (S. O. R.)

U.S. Production of Potatoes by States, 1940 and 1939

	1940 bu.	1939 bu.		1940 bu.	1939 bu.
Surplus late potato states			Vermont	2,142,000	1,950,000
Maine	44,055,000	37,260,000	New Hampshire	1,634,000	1,395,000
Idaho	32,860,000	28,520,000	Rhode Island	878,000	779,000
New York	26,838,000	26,797,000	New Mexico	480,000	480,000
Pennsylvania	24,570,000	22,440,000	Arizona	276,000	220,000
Minnesota	23,750,000	20,315,000	*Intermediate potato states*		
Michigan	20,640,000	24,250,000	Virginia	10,412,000	6,786,000
North Dakota	18,920,000	14,025,000	New Jersey	10,150,000	7,480,000
Colorado	15,210,000	14,400,000	Missouri	5,616,000	4,664,000
Wisconsin	15,054,000	17,33[illegible],000	Kentucky	4,140,000	3,864,000
California	12,480,000*	11,559,000	Maryland	2,898,000	2,375,000
Nebraska	11,340,000	9,720,000	Kansas	2,548,000	2,128,000
Oregon	8,510,000	7,200,000	Delaware	443,000	320,000
Washington	8,325,000	7,350,000	*Early potato states*		
Wyoming	2,400,000	1,620,000	California	10,260,000†	11,089,000
Utah	2,040,000	2,016,000	North Carolina	8,720,000	8,200,000
Montana	2,040,000	1,530,000	Florida	4,312,000	3,480,000
South Dakota	2,016,000	2,400,000	Alabama	4,176,000	4,860,000
Nevada	391,000	280,000	Arkansas	3,895,000	3,003,000
Other late potato states			Tennessee	3,388,000	3,024,000
Ohio	11,800,000	12,600,000	Texas	3,200,000	2,666,000
Iowa	6,120,000	5,600,000	South Carolina	3,192,000	3,108,000
Indiana	4,335,000	4,560,000	Oklahoma	2,550,000	2,244,000
West Virginia	3,630,000	3,040,000	Louisiana	2,280,000	2,106,000
Illinois	3,549,000	3,441,000	Georgia	1,482,000	1,386,000
Connecticut	3,402,000	3,238,000	Mississippi	1,240,000	1,420,000
Massachusetts	3,135,000	2,635,000			

*Does not include early commercial crop. †Does not include late commercial crop.

Poultry. A slight decrease in chicken and a small gain in turkey production was reported for 1940 by the United States department of agriculture. The turkey crop, 33,138,000 birds, was the largest on record, comparable with 32,732,000 in 1939 and a five-year (1932–36) average of 23,081,000. Chicks, produced by commercial hatcheries that report to the department of agriculture, numbered 99,661,000 the first ten months of 1940 compared with 111,947,000 the same period in 1939, a decline of 11%. Advance orders for hatchery chicks Nov. 1, 1940, were, however, 11% more than on the same date in 1939. (For numbers of hens on U.S. farms *see* EGGS.) Cold storage holdings of all poultry Nov. 1 were 114,625,000 lb. in 1940 and 79,200,000 lb. in 1939. Of these 1940 holdings 11,700,000 lb. were turkeys, compared with 8,000,000 lb. in 1939. Prices for chickens ruled moderately higher in 1940, but for turkeys the fall season opened with pronounced weakness because of the record production. To support the turkey market the federal Surplus Marketing administration announced it would buy turkeys for consumption in free school lunches for undernourished children. At approximately the same time as this announcement, a sudden storm, Nov. 9, swept the middle west with freezing temperatures, killing many thousands of turkeys. Estimates of the loss ranged from 800,000 to 1,250,000 birds. Whole flocks were wiped out and some large growers lost as many as 4,000 turkeys. The storm reduced the 1940 turkey supply to near 1939 levels and apparently removed the threat of a cumbersome surplus. The Surplus Marketing administration suspended its proposal to buy turkeys. By December turkey prices had firmed. The federal Agricultural Marketing service reported that turkey specialists at the department of agriculture research centre, Beltsville, Md., were experimenting in developing a "small streamlined bird" as more adapted to U.S. family needs than the heavier commercial bird. Turkey growers, however, favour development of heavy birds with larger breasts. Owing to the larger portions of white meat, restaurants now find it profitable to serve turkey meat in so-called chicken sandwiches. (S. O. R.)

Powder Metallurgy: *see* METALLURGY.

Power: *see* ELECTRIC TRANSMISSION AND DISTRIBUTION; PUBLIC UTILITIES; RURAL ELECTRIFICATION.

Presbyterian Church. The Reformed Churches holding the Presbyterian System, located within the U.S.A., are twelve in number and included in 1940 18,387 ministers, 18,877 churches and 3,990,009 communicant members with approximately 7,500,000 adherents. Outside of continental United States they had 2,204 American foreign missionaries and 13,708 native workers in a total of 21 countries and a communicant membership of 234,101.

The notable increases in church membership reported in 1939 were greatly augmented, the Presbyterian Church in the United States of America and the Southern Presbyterian Church reporting the largest accessions in many years and the greatest communicant memberships in their history. All associated in the National Preaching mission, a series of eight-day evangelistic meetings and conferences in 22 leading cities, and participated in the World Wide Communion service on the first Sunday in October.

In the General assembly of the Presbyterian Church in the United States of America gratification was expressed over the continuance of efforts in search of suitable ways and means of bringing into one Christian fellowship all branches of the Presbyterian family with specific overtures to the Southern and United Presbyterian Churches. Definite progress was reported in the negotiations on organic union with that body and the Protestant Episcopal Church. Emphasis was laid upon the efforts of the World Council of Churches to maintain the fellowship of believers in belligerent areas, thus transcending national and racial boundaries and contributing to mutual understanding and the ultimate consummation of world peace.

The Evangelical and Reformed Church officially put its new constitution into operation, thereby completing the organic union of the Evangelical Synod of North America and the Reformed Church of the United States. Preliminary steps toward union were taken in 1934 when the two churches merged on a basis of mutual respect and confidence. The new church had in 1940 34 synods, 2,478 ministers, 2,873 congregations with a total communicant membership of more than 650,000 and a Sunday school enrolment of almost 600,000.

Maintaining their fundamental belief that "God alone is Lord of the Conscience," several of the supreme judicatories of the Presbyterian family maintained the Christian right of conscientious objection to military service. All adopted official pronouncements in behalf of religious and political freedom at home and abroad, declaring that such freedom was the absolute prerequisite of the Christian way of life.

The Western section of the World Presbyterian alliance, representing the Presbyterian and Reformed Churches in the United States and Canada, held its annual meeting in Rochester, N.Y., Feb. 1940.

Europe.—War, conquest and mass evacuations in 1940 laid tremendous burdens on the Reformed Churches of Europe, though a consciousness that the oecumenical fellowship was surmounting national frontiers even during war noticeably stimulated their faith, vitality and hope for the future. Churches continually contributed money and effort to care for the members and work of the churches of other lands. In general the churches of all parts of Europe were crippled by loss of personnel to army and navy, destruction of churches, hospitals and other property, and the presence of numerous refugees from other parts of their own land or from abroad. During most of the year some countries were almost completely hidden behind the curtain of censorship, including Czechoslovakia, Estonia, Latvia and Lithuania.

In Britain the Presbyterian churches maintained their activities without panic, supported their usual benevolent agencies, contributed largely to the aid of missionary work of the churches of Germany and Holland, carried on Christian service for evacuated pastors and parishioners, for thousands of refugees from the continent and for British soldiers and sailors.

The Church in Germany maintained its work, cared for war prisoners and internees, established "Evangelical Relief Work" as a liaison organization between the German authorities and foreign and domestic relief agencies, and assumed care of the members of the Reformed Church who were among the 500,000 persons received into Germany from the Ukraine.

The Reformed Church of France, opening headquarters in Nîmes, devoted itself principally to maintaining its missionary and benevolence work while its financially strongest churches were still cut off in occupied France. Both in France and in Switzerland the Church gave large sums of money to support thousands of Evangelical refugees from Germany.

The German Evangelical churches in Poland were in process of assimilation into the German Church. Little reliable news came out of Russian Poland.

Much distress was reported from the Evangelical churches of Belgium and Holland; numbers of church edifices were destroyed. In Italy the Waldensian Church effectively carried on its own work and also some activities ordinarily supported by the British churches. (W. B. Pu.)

Presidents: *see* Sovereigns, Presidents and Rulers.

Prices. Commodity prices in leading world markets during 1940 were dominated largely by war developments in Europe and the far east, and also, in the latter part of the year, by military preparations in the United States.

Following the sharp rise in commodity prices in most markets immediately after the outbreak of the European war in Sept. 1939, prices in the countries at war generally advanced further, reflecting sharply restricted supplies in many cases and also unusually large demands for essential commodities. Prices outside the war zones, on the other hand, were generally maintained or tended downward until late in the spring of 1940, reflecting chiefly reduced demand for commodities on the part of manufacturers and traders in the U.S. Early in the year the outlook for world supplies of major agricultural products changed little and foreign exchange rates and shipping charges were fairly stable.

After the early part of May, with the intensification of war on the European continent, price changes were mixed for several months but outside Europe declines predominated. Commodities usually exported to the continent in important volume—including grains, coffee, copper, lead and hides—showed price decreases in producing countries as continental markets were closed by the British blockade. Other commodities such as wood pulp and paper advanced as Scandinavian sources of supply were cut off from markets in the rest of the world.

In the autumn, prices in unrestricted world markets were influenced upward chiefly by the undertaking of a large-scale defence program by the United States and by the increased destruction of world shipping facilities.

United States.—Prices of commodities in wholesale markets in the United States declined generally in the first half of the year and rose in the latter part to about the same level as at

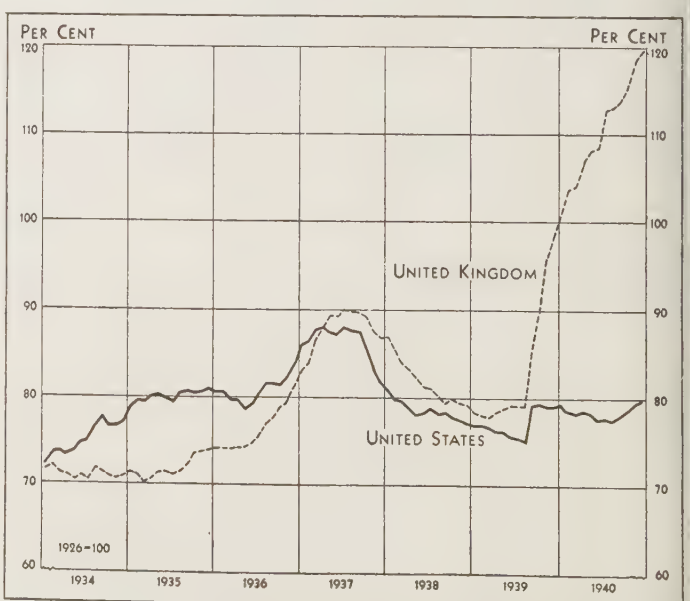

Fig. 1.—WHOLESALE PRICES IN THE UNITED KINGDOM AND THE UNITED STATES. (Source: United Kingdom—Board of Trade, converted to 1926 base; United States—Bureau of Labor Statistics) War conditions in the United Kingdom have made many price quotations nominal; undoubtedly the index for that country understates the rise during 1940

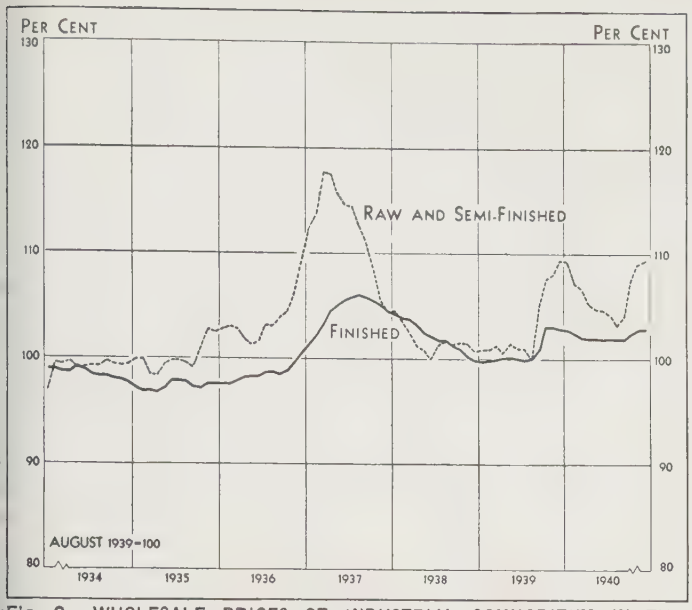

Fig. 2.—WHOLESALE PRICES OF INDUSTRIAL COMMODITIES IN THE UNITED STATES. (Source: Bureau of Labor Statistics data classified by Board of Governors of the Federal Reserve System)

the end of 1939, as shown in fig. 1. Throughout the year, the general level of wholesale prices in the United States was lower compared with prewar than in most other leading countries.

The lower level in the United States reflected partly smaller advances in prices of raw materials. The United States relied far more on domestically produced materials than, for example, the United Kingdom, and price increases for these commodities were less marked than for imported materials. Further, prices of United States imports remained at a lower level than those of the United Kingdom, owing to smaller advances in shipping costs to the U.S. and the fact that there was no depreciation of the dollar in the foreign exchange markets. Also, during most of 1940 there was considerable unused plant capacity and labour in the United States, except in a few lines, which tended to prevent large increases in prices of manufactured goods.

The wave of buying in the United States that followed the outbreak of the European war in Sept. 1939, extended beyond basic commodities into many industrial products. By the beginning of 1940 inventories had been built up in anticipation of further price increases and to ensure manufacturers of adequate supplies of materials. During the early part of the year, with industrial production reduced to a level closer to ultimate consumption, demand for raw and semifinished industrial materials fell off considerably and there were decreases in prices of these commodities, as indicated in fig. 2. Prices of finished industrial products, which had shown a smaller advance in the latter part of 1939 than prices of materials, were mostly maintained at the higher levels. The decline shown for the group reflected chiefly decreases in prices of refined petroleum products resulting from large domestic output and reduction in foreign demand.

In May, with the sudden change in the military situation in Europe, certain commodities which had been held partly for speculative purposes showed sharp price declines, although industrial production in the U.S. began to increase again at this time. Wheat prices, for example, which had been over $1 a bushel, dropped to about 70 cents and grain markets in the U.S. and Canada were closed for a short period to restore more orderly conditions. During the summer, with the capitulation of France and the extension of the British blockade, prices in the United States declined further, reflecting the pressure of foreign supplies of such commodities as copper, lead, coffee and cocoa, which had been cut off from continental markets.

At this time, however, demand for commodities increased in the United States as industrial production rose sharply and exports of manufactured products were maintained at a high level. A large-scale defence program was inaugurated during the summer involving the proposed expenditure of about $6,500,000,000 in the fiscal year ending June 30, 1941. With the subsequent bunching of government military contract awards in September and October for this program, there was a large forward buying move on the part of manufacturers to cover requirements and, with increased demand also from civilian sources, fairly tight market situations developed for such basic materials as wool, copper, zinc, steel and lumber. Prices of many of these commodities showed large advances and there were smaller increases in a number of other commodities including some manufactured goods such as automobiles. At the end of the year prices showed more stability.

During this period of the second half of the year industrial activity rose to new record levels. Changes in costs were varied and to some degree offsetting; while prices of materials increased in many instances, costs of manufacture were often lowered as a result of higher rates of operation. Wage rates generally showed little increase and corporate profits, after allowances for increased taxes, were much advanced over 1939.

In connection with the defence program the federal government had adopted a policy directed to the stabilization of commodity prices, and many sellers exercised restraint in pricing their products in this period of sharply increased demand. The government also initiated a program during the summer for accumulating stockpiles of such strategic imported materials as rubber, tin and ferromanganese, to be used in the event that normal supplies were cut off. This action was an important influence in strengthening both domestic and world prices of these commodities. Contract conditions under which these stockpiles were to be accumulated were such as to withhold them from the market for some time to come. Arrangements were also made by the government for the accumulation of large supplies of foreign copper and wool.

Production of major crops in 1940 was about average and, with domestic carryovers heavy and export demand curtailed to the lowest level in many years, supplies of staple farm products were large throughout the year. Prices of cotton, wheat and

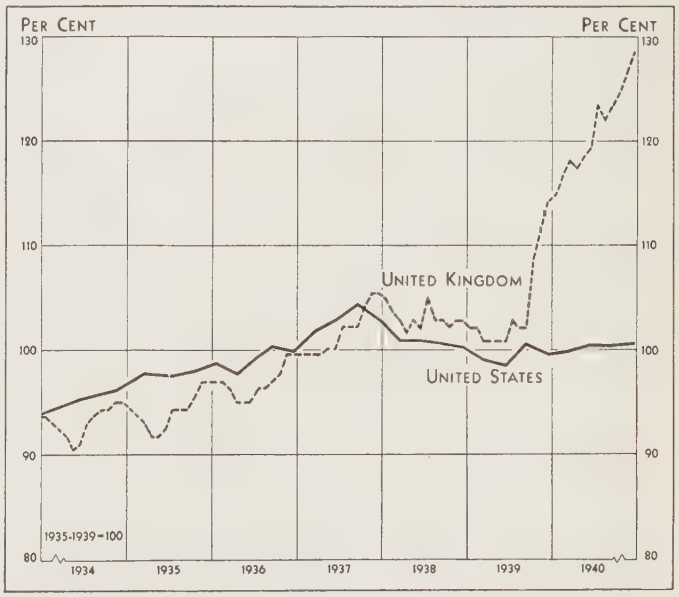

Fig. 3.—RETAIL PRICES IN THE UNITED KINGDOM AND THE UNITED STATES. (Source: Cost of living indexes. United Kingdom—Ministry of Labour, converted to 1935–39 base, first-of-month figures; United States—Bureau of Labor Statistics, mid-month figures quarterly in recent years) See note to fig. 1

corn, however, remained close to the minimum levels at which the government granted loans to producers participating in the federal farm program and for a number of farm products and foods largely consumed in the domestic market, there were price advances in the latter part of the year due to the rise in consumer incomes. At the end of the year, prices of livestock and their products as a group were about 10% higher than at the beginning of the year, while prices of principal crops and their food products were about 5% lower.

Prices of commodities in retail markets in the United States showed little change during most of 1940 but generally were somewhat higher at the end of the year, reflecting chiefly rises in foods, particularly livestock products, and small advances in prices of clothing and rents; the total cost of living was only slightly higher than during 1939, as shown in fig. 3.

United Kingdom.—Wholesale prices in the United Kingdom generally rose sharply throughout 1940 with the largest increases after May, as shown in fig. 1. The rise, which occurred despite governmental control of the distribution and prices of many commodities, reflected partly marked advances in costs both of domestic and imported raw materials. Increases in the latter group, however, were much larger than for domestic commodities, owing chiefly to the closing off of supplies from the Baltic, Scandinavian and Low Countries, increased difficulties in securing supplies from other areas, and sharply advanced shipping charges. As a result of foreign exchange controls established in March and June to reduce the amount of sterling in non-British hands, currency depreciation was no longer an important factor in increasing domestic prices of international commodities. Most of the effects of depreciation on these prices had been felt following the outbreak of war, when the official sterling rate declined from $4.68 to about $4.00 to the £. This had required the payment of more sterling currency and thus increased prices for many imported materials.

Demand for both imported and domestic commodities was sharply increased after the middle of the year as a result largely of heavy national war expenditures, dislocation of productive facilities, destruction of supplies and equipment and rising consumers' income as a result of greater employment and increased overtime payments.

The various governmental price arrangements undertaken in the latter part of 1939 were extended further in 1940. Trading in only a few commodities, including cotton, rubber, jute and tin, was left comparatively unrestricted. Also, the prices established for such commodities as copper, lead, spelter, steel and timber, which had been fixed at the beginning of the war, were raised from time to time during 1940. The program for bulk governmental purchases of empire and dominion products, such as wheat, cocoa, wool and non-ferrous metals, was continued. Many special measures were adopted to reduce imports of non-military commodities from sources outside the empire. Also, the government encouraged exports in order to conserve currency exchange resources.

Early in the summer, in response to a growing recognition that the war effort was inadequate, the ministry of supply was given complete authority to control the procurement of commodities and all aspects of manufacturing and distribution. Price changes in individual lines were thus greatly affected not only by wartime economic conditions affecting their supply and demand, but also by a broad system of administrative controls by the government and private business groups acting under governmental authority.

Rationing of a number of basic foods to individual consumers and controls of retail prices and margins were continued under the direction of the ministry of foods. An attempt to stabilize retail prices of major foods entailed payment of subsidies amounting to around £1,000,000 per week by the government.

Prices of other essential consumer goods were subject to control by the board of trade under the Prices of Goods act, effective Jan. 1 on a limited range of clothing and household goods and extended in June to cover most household necessities. The act provided that increases in wholesale and retail prices should not exceed increases in costs of producing and selling these goods.

More important measures affecting prices were the Limitation of Supplies Order and the Purchase tax. Under the former, which became effective in June, quotas were established for the sale of consumers' goods by manufacturers to the retail trade, restricting such sales to two-thirds of the value of sales in the preceding six months. Under the Purchase tax program, which became effective at the end of October, taxes from one-sixth to one-third of the wholesale value were placed on domestic ironware, clothing materials, garments and footwear except children's. Commodity prices were also affected by large increases in indirect taxes on beverages, sugar and tobacco. These actions, which were designed to conserve supplies and to encourage the transfer of facilities from non-essential to essential work, tended to limit further civilian purchases of commodities.

Thus while the various governmental measures had the effect of accelerating the rise of some prices and retarding increases in others, the underlying economic effects of the war resulted in a continued advance for both wholesale and retail prices during the latter part of the year. Living costs at the end of 1940, according to the official index shown in fig. 3, were about one fourth higher than in Aug. 1939. (*See* also AGRICULTURE: *Foreign Trade and Agriculture;* COST OF LIVING; FINANCIAL REVIEW; and articles on individual commodities.) (C. GN.)

Prices, Commodity: *see* AGRICULTURE; PRICES.
Primary Education: *see* EDUCATION, ELEMENTARY.

Prince Edward Island, the smallest in area but the most densely populated province in Canada, lies in the Gulf of St. Lawrence in the shape of a crescent, its inner side towards the north. It is nine miles from the mainland; across the separating strait powerful ice-breaking ferry-boats ply in winter and summer carrying railway cars, automobiles, passengers and freight, the crossing taking 40 minutes. There was also in 1940 a daily air mail and passenger service connecting with transcontinental Canadian airways and American and Canadian Colonial airways. The island is 137 mi. long, and varies in width from 2 to 32 miles. It contains 2,133 sq.mi. The population, Canadian census 1931, was 88,038; estimated Dec. 31, 1940, 93,000 of which 81% is rural. Charlottetown, the capital, 12,361; estimated Dec. 31, 1940, 13,500. Of the island's population 80% is of British descent; 14% French; 42% is Roman Catholic and 58% Protestant, of which 28% is of the United Church, 18% Presbyterian; and 6% Anglican.

To Dec. 31, 1940 the estimate of revenue was $1,800,000; estimated expenditure, ordinary, approximately the same; capital expenditure including provision for sinking fund $850,000, of which interest absorbed over $300,000. The dominion subsidy was approximately $650,000. Of the revenue, $370,000 went to education, the total cost of which was $550,000. Pupils enrolled were 18,800; cost per pupil $30; teachers 700; average salary $505. The public debt Dec. 31, 1940 was approximately $6,000,000; per capita $67. Income, real estate and succession taxes are moderate.

The main occupations are agriculture and fishing; 485,000 acres are under cultivation. The capital investment in agricultural industry in 1940 was $53,500,000; in manufacturing industry, $2,500,000. The estimated total value of farm products in 1940 was over $13,000,000; potatoes (approximately) 7,800,000 bu.; turnips 5,000,000 bu.; oats 5,000,000 bu.; wheat 250,000 bu.; hay and clover 335,000 tons; mixed grain 1,625,000 bu.; barley 350,000 bu.; butter 2,000,000 lb.; cheese 470,000 lb.

The estimated value of fisheries was $600,000; oysters 850,000 lb.; estimated fox pelts, 80,000, valued at $1,500,000. There is little serious crime, and practically no illiteracy. (CY. M.)

Princeton University during 1940—its 193rd year—improved its curriculum, in pursuit of a policy of meeting the needs and aptitude of the individual undergraduate.

It rearranged its academic calendar to allow extension of the opportunities of "reading periods," previously restricted to upperclassmen, to freshmen and sophomores. A creative arts program was introduced, designed to permit talented undergraduates to approach the study of art, music and literature from the viewpoint of the artist rather than that of the objective scholar. It again geared itself to meet a national emergency, offering all of its facilities for the prosecution of the defence program. Various projects were assigned to its scientific laboratories. Among new research projects was a study of the effect of the European war upon public opinion in the U.S.A. Gifts received totalled $1,287,056. Enrolment, which is controlled by a policy of limitation, was 2,707, of which 302 were graduate students. The teaching staff numbered 412. (H .W. Do.)

Principe: *see* PORTUGUESE COLONIAL EMPIRE.

rinting. Printing inks featured graphic arts developments during 1939, but presses stepped into the spotght during 1940. Major printing methods have individual adıntages. Relief (letterpress), the most extensively employed, supreme for sharp impressions of type and bringing out fine etail in continuous tone (photographic) illustrations. The great lvantage of intaglio (photogravure and rotogravure) is that it ost closely approximates the appearance of a genuine photoaph. This is due to the wider range and greater depth of tones ıe method provides. Offset (planography and lithography) is ost economical, especially where there is a considerable number illustrations. While the quality of offset approached that of tterpress in a general way, and coated paper might now be ed, it is the superior method where a water-colour painting ust be reproduced. Character of colouring and adaptability to ugh papers account for that advantage.

The foregoing is introductory to a development in process in 940—presses which would print letterpress and gravure, say, multaneously just as the two-colour press prints two colours l but simultaneously. The object of such combination presses to utilize the best method for the type and the best, or most conomical, method as the case might be for the illustrations.

The greatest development during 1940 was a combination relief ıd offset press. Unlike the projected developments noted above, ıis machine works one process or the other, one at a time only. ertain adjustments, swiftly made, convert the machine from ffset to letterpress or vice versa.

Only two cylinders are used for offset work instead of the conentional three-cylinder offset press construction. The upper ylinder is composed of a plate segment and an impression segıent and is twice the circumference of the blanket cylinder. hus the blanket cylinder takes its impression on the first revolon, then transfers it to the paper during its second revolution as ıe impression segment reaches it.

Changing to relief printing requires but a few minutes. The ampening unit is lifted off, the plate segment removed and a hannel segment for loose type and electros, or a segment for ıounting rubber plates is readily substituted. The blanket ylinder then becomes the platen and the machine is ready to perate letterpress.

The method best adapted to the particular item to be printed ıay be utilized with only the one press. While this machine was ı 1940 built only in small size for office use, like the multiraph, the manufacturers contemplated larger presses for the rinter.

Use of rubber in printing grew apace because of economy in late costs and preparatory work (make ready) on the press. Due o resiliency of rubber, plates moulded from it adapt themselves omewhat to the uneven surface of paper and inequalities in the ress itself, which is not the case, of course, with unyielding ıetal. During the year a new and rather large press built for ubber plates only was introduced for producing books and cataogues. It was anticipated that considerable savings could be ccomplished, particularly on books, like novels, which are not lustrated.

A new metal plate for illustrations is of thin copper. Between ıis and the wood mount is a layer of medium rubber. The ıeory, and it seems a sound one, is that while retaining the adantages of etching and of the metal printing surface, there is ıat resiliency which permits of less preparatory work before the ress is started.

An ink-drying mechanism for any type of roll- or sheet-fed ress was developed which, it is claimed, cuts drying time in alf. Its principle is the same as that of the sun heating the arth. Heat energy radiated by the sun makes a mountain climber perspire in spite of cold surrounding air. This is "radiant heat" —molecular at the radiator and at the receiver. The transfer from one to the other is by wave motion which wastes no heat.

MIXING PIGMENT COLOUR with varnish—the first step in the manufacture of ink. Instant-drying inks perfected in 1939-40 made possible much faster printing of magazines, newspapers, packages and labels

Radiant heat transmission on a printing press is done by a burner, heated by gas, with refractory surfaces getting as hot as 2,300° F. These surfaces give off infrared heat waves and have the appearance of a string of burning coals.

The burner bars may be attached to a press without changing the press itself, operate on a natural or manufactured gas, have safety devices to prevent accidents, and start and stop with operation of the press. (J. L. F.)

Prisons. Various new buildings were constructed in prisons of the United States during the year 1940. A shoe factory was added to the Southern Michigan State prison. The Minnesota State prison opened a new farm colony building to house all inmates working outside the walls. At the Huntsville unit of the Texas prison system, a textile mill was erected and the prison stadium originally seating 18,000 visitors was enlarged to accommodate 30,000, the number usually attending prison baseball games or the annual rodeo show.

A hospital and factory building were added to the Indiana State prison, while at the Maine State prison minimum security barracks were built on the farm. The Virginia penitentiary completed a power house and had under construction in 1940 a cell block which will house 500 men. At the Iowa State penitentiary, a power plant was being erected. The Florida State prison completed a new hospital and cell block. A chapel and cell block were added to the Washington State penitentiary; a tubercular hospital to the Louisiana State penitentiary.

At the West Virginia penitentiary plants were installed for the manufacture of paint, soap, tobacco, clothing and sheet metal products for state use. West Virginia also erected a new medium security prison which will accommodate 600 prisoners.

The old cell hall built at the Wisconsin State prison in 1851 was torn down and a new cell block erected. The Oregon State penitentiary reports the construction of a large, modern dormitory on the farm where trusties are employed and a modern dining room, auditorium and hospital in the prison proper.

The federal government opened several new institutions during 1940. The one at Denver, Colo., will be used for the imprisonment of young male first offenders, between the ages of 17 and 25, who are sentenced to serve not more than 18 months, as well as men awaiting trial for federal offences. The Texarkana, Tex., institution will be used for 400 short-term male prisoners from Texas and nearby territory. Short-term male prisoners from Kentucky and adjoining states will be sent to the correctional institution at Ashland, Ky. The Danbury, Conn., institution will be used for male prisoners from New York and New England states with sentences in excess of 18 months. A wall-less penitentiary was also opened in Terre Haute, Ind., to house 1,050 inmates.

At the Wisconsin State prison the silent system, a relic of antiquated penal practices, was at last abolished and inmates were permitted to converse with one another. They were also allowed to smoke cigarettes (previously they could only smoke pipes). For years, any outsider had the right to be taken through the prison upon the payment of a 25-cent admission fee. That practice was discontinued in 1940 and visitation restricted.

Several state prisons report the starting of classification departments and the segregation of various types of offenders. The opening of many farms and road camps allowed the transfer of prisoners, most amenable to reform, to places where they could live a more normal existence than within prison walls.

At the Minnesota, North Carolina and Indiana State prisons, earphones have been placed in each cell so that inmates can hear the radio programs which are transmitted from a master unit in the prison. Formerly, these institutions did not permit that form of entertainment although many others did The value of radios in prisons cannot be overestimated. Allowing inmates to keep pace with world events, through news and educational broadcasts, and hear entertainment which interests people on the outside, prevents them from deteriorating mentally and losing contact with the community to which they will some day return.

The year 1940 also witnessed improvement in the educational facilities in many prisons, particularly in the field of vocational education. Realizing the necessity for guiding penal officials in this important work, the American Prison association issued several valuable books outlining procedures which can be followed. There was also a decided trend toward training prison guards for their work before assigning them to an institution. During 1940 Michigan was added to the list of states maintaining officer schools.

Because of the European war, little information was available about changes, if any, in European prisons. (L. E. L.)

Prizes: *see* LITERARY PRIZES; NOBEL PRIZES.
Progressive Education: *see* EDUCATION, PROGRESSIVE.
Progressive Education Association: *see* ACADEMIC FREEDOM; EDUCATION, PROGRESSIVE; UNIVERSITIES AND COLLEGES.

Propaganda. Only in the light of events as they unfold to form a pattern revealing cause and effect can propaganda strategy be discerned. Events in Europe and America by the close of 1940 revealed Adolf Hitler as one of the most effective propagandists in all history. It was clear as the year drew to a close, that his succession of military victories, which had made him master of Europe from the arctic to the Mediterranean, had come almost inevitably as the result of a shrewdly calculated propaganda campaign which had preceded, accompanied and been co-ordinated with his military strategy of total war.

Hitler once had told Hermann Rauschning in effect that as artillery preparation preceded infantry attacks in battles in the World War of 1914–18, propaganda preparation would precede actual physical warfare in the coming war in order to effect "the psychological dislocation of the adversary."

After Denmark, Norway, the Low Countries and France had fallen before Hitler's lightning strokes in the spring of 1940, it became apparent that France, particularly, had already been defeated by Hitler's propaganda before he had outflanked the Maginot line with his dive bombers and *Panzer* divisions.

His formula in demoralizing democracy in France, to make impotent its military power, was substantially the same formula Hitler had used to bring an end to democracy in Germany. In France, as in Germany, vast numbers were the victims of depression and unemployment. They were confused and desperate, floundering for leadership to bring order out of a chaotic economic situation which seemed to threaten their very lives. Those who still had economic security were fearful of the masses and particularly fearful of group organizations, such as labour unions with programs for more equitable distribution of wealth.

Such had been the situation, too, in Germany in the years before Hitler came to power in Jan. 1933. There his propaganda strategy accomplished three things: First, he gave to the people a scapegoat, the Jewish population, upon which they could lay the blame for their suffering. Second, by picturing himself as the bulwark against Russian communism he won support of industrialists, bankers, journalists, statesmen and churchmen, including the pope who in 1933 signed a concordat with him, thereby transferring to the nazi government the sanction of the Vatican. Third, he associated "Jews" with communism and communism with democracy, which he called "the foul and filthy avenue to communism." So it was, by the use of the most common of all propaganda devices, name calling, that he made "Jew," "communism," and "democracy" poison words which, with constant repetition, came to evoke automatically a negative response. These words were charged with connotations of evil and wickedness as the word "heretic" had been in the middle ages. The minds of tens of millions not only in Germany but in France, Britain and the United States were conditioned by Hitler to respond negatively and automatically to these poison words. Thus Hitler put to effective use the conditioned reflex principle which earlier had been so clearly revealed by the Russian psychologist Pavlov in experiments on dogs. Pavlov discovered that if a dog is given food its saliva runs automatically; if the ringing of a bell accompanies the feeding, after 40 to 60 feedings the sound of the bell causes saliva to run even though no food is given.

As soon as Hitler was able to make democracy a bad word in Germany by associating it with Jews and communism and as soon as the German people, industrialists, churchmen and masses alike had become conditioned to respond negatively to the word democracy, it was easy for Hitler to destroy democracy in Germany. This he did almost immediately after becoming reich chancellor.

The same process operated in France, and to less degree in Britain and in the United States where Hitler's propaganda affected, particularly, business, political and religious leaders who feared the potential revolutionary acts of millions who were suffering as the result of depression and unemployment. It became popular among these leaders in western Europe and America to see in German and Italian fascism a necessary "defence mechanism" against "communism"; and to their minds the specific democratic rights of criticism and organization were "communistic." The fact that Stalin and his followers, in the years immediately preceding the war beginning in 1939, espoused democracy as cordially as Hitler opposed it caused many to believe that Hitler was right—that democracy was the "foul and filthy avenue to communism."

Thus it was that Hitler, after he had come to power in Germany in 1933, was encouraged by the statesmen of France and Great Britain to build a powerful military machine. They saw him as their bulwark against the soviet union, as the defence against "communism" at home as represented by demands of labour unions for higher wages and shorter hours and by demands for the socialization and democratization of industry. In foreign policy, therefore, they gave backing to Hitler in his help to set up a fascist Spain under the leadership of General Franco. They approved the Austrian anschluss and the ceding of the Sudetenland area of Czechoslovakia culminating in Munich. As Hitler's military power increased, the strength of his propaganda grew. His purpose was not to win friends for nazi Germany, but rather to make the peoples of France, Britain and America weaken themselves by internal dissension. His strategy was to set Gentile against Jew, Protestant against Catholic, capital against labour and anti-communist against "communist"—thus to sow seeds of

doubt, suspicion, jealousy and hatred, culminating in apathy, defeatism and demoralization. Munich marked a high point of success of this policy. Chamberlain and Daladier won acclaim because they had secured "peace in our time." President Roosevelt was lauded for his part in making the Munich pact possible.

The cumulative effect of Hitler's anti-democratic propaganda continued after the outbreak of war. The early months of war were so quiet as to cause many to term it a "phony" war. In this period Britain and France tried to win fascist Italy to their side, and American shipments of oil and scrap iron to Italy mounted higher and higher. At the same time Britain and France made preparations to fight Russia by encouraging Finland's resistance to the soviet union. In the minds of Chamberlain and Daladier there still lingered, apparently, the belief that communism and democracy were the real enemies and that fascist Germany—if Hitler were overthrown by an army revolution—might join with Britain in war on the common enemy, Russia. Hitler's lightning invasion of Norway ended this dream, tumbled Chamberlain from his position as prime minister of Great Britain and replaced him with Winston Churchill.

Through all the years preceding the outbreak of war, Churchill, anti-nazi Tory and himself a dynamic propagandist, saw Britain's chief enemy not in Stalin but in Hitler. With the beginning of Hitler's *Blitzkrieg* in the west the British people who had supported Chamberlain in his appeasement policy began to demand his replacement by Churchill, the outstanding and consistent opponent of appeasement. It was Churchill, as national leader, as master-persuader of men, who checked Hitler's power and rallied England and the United States against "defeatism." In this he was reflecting the fighting spirit of the British people in words which revealed his extraordinary ability as a propagandist: "I have nothing to offer but blood, toil, tears and sweat." Later, stating the policy of his government, he declared: "I say it is to wage war by land, sea and air—war with all our might and with all the strength God has given us. . ." "We shall defend our island whatever the cost may be: we shall fight on beaches, landing grounds, in fields, in streets and on the hills. We shall never surrender. . ."

Hitler met, for the first time, a compeer in propaganda. Nonetheless, he still held the initiative. In the democracies his propaganda, through the preceding years, had undermined faith in democratic criticism, in labour unions, in government measures for the unemployed. It had caused some men in positions of economic power as well as some educators, politicians and clergymen to see in these things the spectre of "communism." So thoroughly had the minds of such men in England been conditioned by Hitler's anti-democratic propaganda that Churchill's attempts to woo Russia to Britain's side were unsuccessful. Competent though he might be as a national leader and propagandist, Churchill was unable, immediately, to remove Hitler's appeasers from the British cabinet and to replace them with men who had a stronger belief in democracy. This, together with the failure of Britain to grant independence to India, operated as an inhibiting moral factor in winning stronger support for Britain in America.

"BUT HOW ABOUT THE GROUND FLOOR?" points out Manning of the Phoenix *Arizona Republic* in scanning the U.S. national defence scene of 1940

The cumulative effect of Hitler's anti-democratic propaganda, strengthened as it had been by Stalin's support of Loyalist Spain and the Popular Front in France, explained at least part of the reluctance of most Americans to participate in the European war. That reluctance was explained, also, by the disillusionment which had followed the war of 1914–18 "to make the world safe for democracy" and by the belief that the European war was merely a repetition of the war of 1914–18.

These factors must be kept in view in analyzing the great propaganda campaigns directed at Americans during 1940. In essence these centred on one issue—aid to Britain against Hitler. This issue was dominant in the presidential campaign. Most Americans wanted Britain to win. President Roosevelt, who was breaking the third term tradition by running for re-election, propagandized by act and word for aid to Britain. His acts included endorsement of peacetime conscription (enacted into law before election day) and the deal which gave Britain 50 U.S. destroyers and the U.S. the right to establish naval bases on British territory in the western hemisphere. His frequent denunciations of nazi and Italian fascist aggression were in words more effective than those of Winston Churchill.

Roosevelt's propaganda was crucial in counteracting the propaganda of Americans who believed in a policy of isolation. The isolationists included men like Senator Robert Taft and Senator Arthur H. Vandenberg, who had campaigned for nomination for president on the Republican ticket. That nomination went to a former Democrat, a public utility executive, a propagandist against Roosevelt's New Deal, Wendell L. Willkie. Many believed that Mr. Willkie, if elected president, would follow the program of the isolationists. This belief was dissipated when, against the wishes of isolationist supporters like General Hugh S. Johnson and John T. Flynn, Mr. Willkie endorsed the destroyer-naval base deal and the Roosevelt policy to give Britain all aid "short of war." But while Mr. Willkie talked about such aid, Mr. Roosevelt, as president, could and did act.

His acts were more effective propaganda than Mr. Willkie's words. Furthermore, Mr. Willkie was supported by numerous individuals and groups who if not anti-British were vociferous propagandists against aid to Britain which might lead to war.

The presidential campaign was, therefore, a propaganda battle confused by widely divergent opinions as to what should be done to save America from the menace of Hitler. Interventionists and isolationists alike proclaimed their desire to defend America. Interventionist propagandists, like those of the powerful William Allen White Committee to Defend America by Aiding the Allies, together with President Roosevelt and most of the influential newspapers, saw England as America's "first line of defence." Many of the isolationists, represented, for example, by such an organization as the America First committee, feared involvement in war if "all-out" aid were given. It would seem that the United States people believed some help should be given to Britain. They differed on how much.

Despite advisers who urged an isolationist policy, Wendell Willkie endorsed President Roosevelt's policy of full aid to Britain. Roosevelt's earlier foreign policy had paralleled Britain's plan of appeasement with respect to both Spain and Munich. By May 1940 Roosevelt's foreign policy, like Britain's under Churchill, was nonappeasement, emphatically so. Willkie came out against conscription of wealth while Mr. Roosevelt supported it—in principle. Mr. Roosevelt was elected. The campaign to aid Britain, hardly interrupted by the presidential campaign, went ahead at increased speed. Despite counterpropaganda of the America First committee and the No Foreign War committee, at the close of 1940 many students of world events believed that the threatened defeat of England and the aid-to-Britain propaganda would get the U.S. into the war by the spring or early summer of 1941, possibly earlier.

Their belief was strengthened by Roosevelt's radio address to the nation on the evening of Dec. 28 when he said: "Never before since Jamestown and Plymouth Rock has our American civilization been in such danger as now. . ." "If Great Britain goes down . . . all of us in the Americas would be living at the point of a gun . . . To survive in such a world, we would have to convert ourselves permanently into a militaristic power. . ." "We must be the great arsenal of democracy."

Throughout 1940 Roosevelt had collaborated closely with various representatives of the British government, but particularly with the British ambassador to the United States, Lord Lothian, who, up until the time of his death in December, had revealed himself as a brilliant propagandist in marshalling American aid to Britain. Co-ordinating their propaganda with that of Roosevelt and Lord Lothian were the William Allen White committee and many groups and individuals, among them: University presidents like J. B. Conant of Harvard, Nicholas Murray Butler of Columbia, Charles Seymour of Yale; journalists like Dorothy Thompson, Ralph Ingersoll, Walter Lippmann; newspapers like the *New York Times*, the *New York Herald Tribune*, *PM*, and the *Chicago Daily News;* liberal journals like the *Nation* and the *New Republic;* Henry Luce's publications—*Time*, *Life* and *Fortune;* ministers like Bishop William T. Manning and Reinhold Niebuhr.

As the year 1940 ended, three extraordinarily effective propagandists were struggling for world mastery. On one side was Hitler; on the other were Churchill and Roosevelt. Hitler still held the initiative, but in the last half of the year he had been noticeably checked by his two powerful adversaries. They, like Hitler, himself, were co-ordinating propaganda with every function of the state, with industry, with education, with religion and with military power. As Hitler had done earlier they, by the close of 1940, were utilizing propaganda as a basic weapon of total war.

BIBLIOGRAPHY.—Five significant volumes dealing with propaganda appeared during 1940:

Serge Chakotin, *The Rape of the Masses*. A dissertation on the psychology of totalitarian political propaganda. Specifically, it revealed how Hitler had made use of the conditioned reflex to evoke automatic, negative responses to democratic ideas and practices and who had thereby effectively stamped out democracy in Germany and seriously weakened it throughout the world.

Edmond Taylor, *The Strategy of Terror*. This was a detailed account of how Hitler's propaganda had destroyed democracy in France by accentuating religious, economic and political dissensions among the French people. Mr. Taylor wrote from personal observation of conditions in France where he had served as a correspondent.

Lawrence Dennis, *The Dynamics of War and Revolution*. Mr. Dennis saw propaganda for democracy and capitalism as futile because he saw the capitalistic system and parliamentary democracy doomed by world conditions which made collectivism an inescapable necessity.

Harold Lavine and James Wechsler, *War Propaganda and the United States*. The authors, utilizing the resources of the Institute for Propaganda Analysis, revealed the methods and goals of the propagandas of the British, French and Germans as these were directed, especially at Americans, during the war months immediately preceding Hitler's *Blitzkrieg* in western Europe.

Volume III of the publications of the Institute for Propaganda Analysis. This included analyses of various salient propagandas of the year, including Hitler's propaganda for *Blitzkrieg*, Mr. Roosevelt's foreign policy, the fifth column and the presidential campaign. (C. R. MR.)

Proteins: *see* BIOCHEMISTRY.

Protestant Episcopal Church.

Throughout the year 1940 the Protestant Episcopal church, like all churches, was stirred and affected by the outbreak of paganism, brutality and ruthless aggression in this world.

The general convention undertook to raise and send a gift of at least $300,000, and as much more as possible, to aid the Church of England in missionary work in many parts of the world. In its general work within the United States the Episcopal church made some advance in 1940, but its missionary work was gravely affected by the world conditions, especially its work in Japan and China. At the triennial convention which met in October in Kansas City, Mo., full intercommunion with the Old Catholic churches that are in communion with the See of Utrecht was ratified and membership was accepted in the World Council of Churches which was in process of organization. Although this action was strongly opposed, it was voted that the Episcopal church should become a full member of the Federal Council of the Churches of Christ in America with which the church has hitherto co-operated through its department of Christian social service.

The statistics for 1940 showed an increase in most items and a marked increase in contributions in spite of the continued financial uncertainty. The official reports showed a total of 2,171,562 baptized persons, an increase of 14,288 during the year, and a total of 1,489,384 communicants, an increase of 22,786.

(W. T. M.)

Prunes: *see* PLUMS AND PRUNES.

Psychiatry.

In 1940 psychiatrists in the armed forces of many countries were evaluating their old problems and anticipating the new ones associated with modern warfare. Sutton, writing on conscription for the U.S. navy, emphasized that the navy has no use for maladjusted individuals and that the services should no longer be considered as reform schools. Careful selection of candidates for the navy has tended to eliminate the mentally deficient, the psychoneurotic and the incipient psychotic. Mistakes are still made, however, at the time of enlistment by psychiatrists and recruiting officers, because an adequate past history of the recruit is not at hand, particularly in regard to the individual's powers of adjustment to an ordinary environment. During 1917 and 1918, about 1% of the U.S. navy was discharged each year with mental disease. It is believed that this figure could be reduced if a more complete history of each recruit was obtained.

In the warring countries the old problem of eliminating the nervous and mentally unfit, before taking them into the armed forces, was ever present. The psychoneurotic, as pointed out by the *Lancet*, except in rare instances, has no place in the modern army. His disease is constitutional and must be recognized as such. A breakdown may result from a trivial cause with no particular strain, or the individual may only give way under prolonged and violent pressure, such as occurred at the evacuation of Dunkirk, as reported by Sargent and Slater. Whatever the cause and whatever the result, psychiatrists believe that the background and mechanism are the same, varying only in amount and degree. Susceptible individuals do not have normal recuperation powers and are only capable of feeble adaption, if any adaption is possible. For the lighter cases, the margin between breaking down and being able to carry on, is a narrow one and easily crossed in either direction. More serious cases develop hysterical symptoms. Rapid recovery is often possible, but not if the soldier knows that he is going back to army life and the possibility of previously experienced, precipitating circumstances. The worth of such an individual, even if he can be returned to active duties, is more than dubious. If one could eliminate from the army all neurotic and potentially neurotic men, a few valuable soldiers would be lost, but thousands of indifferent ones and more thousands of no use at all would be removed. Malingering is not much of a problem to the psychiatrist; most evaders are quickly picked up. They, too, should be excluded from the army; a man who is willing to lie to gain discharge, is hardly likely to be a useful soldier.

The importance of sleep in the treatment of the war neurotic formerly called the "shell shocked soldier," was emphasized by Sargent and Slater, based on their experience with the British evacuated from Dunkirk. To render the patient more receptive to suggestion and exploration, persuasion and other psychotherapeutic measures, they used sodium amytal, a sedative, by the intravenous drip method, an interesting addition to the older forms of treatment.

Schizophrenia.—The attack on schizophrenia (dementia praecox) continued with unabated force. The chief therapeutic method was that of induced convulsions, using drugs such as metrazol, camphor, insulin, or by mechanical means, with electricity. All the means used have shown fair results but with marked variation in both response and in permanency. No method of treatment has been so satisfactory as to exclude the others; all have dangers and deaths or serious accidents are not infrequently reported. Dislocations of joints and fracture of bones, too, often result from the uncontrolled convulsion, caused by the most frequently used drug metrazol. Drugs to offset the violence of the seizures, such as curare and beta-erythyroidin hydrochloride, are now being tried. Notes of caution, because of this and other reasons, are appearing with increasing frequency in the medical literature. Kwalwasser believed his results with metrazol were poorer than with psychotherapy; Whitehead warned against irreversible changes in the brain; other investigators found the metrazol results disappointing, while insulin treatment gave somewhat better figures. Of the various forms of drug treatment, insulin, the original Sakel preparation, appeared to give the best results. The results, however, are increasingly less satisfactory, for fewer permanent cures are reported year by year. An unusual complication of insulin treatment occurred in the warring countries; rationing reduced the amount of sugar allowed in Britain to less than 1 lb. a day, an amount needed to terminate coma. McGregor reported that a substitution of potato soup was satisfactory.

Electric shock treatment for schizophrenia, based on the original work of Cerletti and Bini in Rome, giving a single convulsion at a time, which may be repeated, is at present much favoured. Many of the uncontrolled factors of drug-induced seizures are

eliminated. The result of treatment by this method appears to be about as valuable as by other means. The treatment, as pointed out by Fox, is still in a preliminary stage of investigation. All forms of shock therapy are being used for various psychotic disorders, such as depression stupor and agitated melancholia, as well as schizophrenia.

In the depression states, particularly with agitation, the original work of Moniz on surgical destruction of the association pathways of the frontal lobes, called prefrontal lobotomy, was finding increasing acceptance among psychiatrists. As more cases are reported and longer intervals are recorded after operation, this procedure, considered so radical a few years ago, is becoming recognized as a valuable method of treatment in selected individuals.

Drug Addiction.—The effect of marijuana, an extract of the hemp plant and used in cigarettes as a drug, has been investigated by Walton, Adams and others. The drug is used extensively throughout America; in India 12% of all admissions to the Bombay mental hospitals in 1937 were the result of taking hemp in some form. Its general effect on humans is to weaken the will, but it is believed that marijuana seldom, if ever, makes the individual so weak, as popularly alleged, that he will commit rape, suicide or murder. The drug, moreover, is not strongly habit-forming and most psychiatrists now believe that taking it does not lead to sexual or other violent crimes. Drug addiction, in general, moreover, according to Lindesmith, is not often associated with serious crime, but an extensive "mythology" has grown up around this idea.

Lindesmith "debunks" many concepts fixed in the popular mind, when he says:

Most violations by drug users consist of violation of the narcotic laws and petty offences; there are no truly reliable signs of drug addiction; the steady use of opiate drugs produces virtually no known significant pathological symptoms, aside from the addiction itself; few addicts become moral degenerates and those from secondary causes; not a few successful, professional and business men are addicted to drugs and take them without signs of mental deterioration for years, provided their supply is adequately maintained by a physician; punishment not only leaves a stigma, which carries over to the social and vocational life of the individual, but extends his acquaintance with drug users and peddlers. (*See* also NERVOUS SYSTEM.)

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(H. R. V.)

Psychical Research.

Studies of telepathy, clairvoyance and precognition, generally included under the heading of "Extra-Sensory Perception" or "ESP," were during 1940 characterized by two features. One is the resurgence of ESP experimentation in the psychical research societies, both in America and in England. The other is the appearance of new evidence for precognition on both sides of the Atlantic.

In the United States there appeared further evidence of ESP. Two Columbia psychologists, Dr. Gardner Murphy and Ernest Taves, conducted card-guessing tests in the laboratory of the American Society of Psychical Research in New York. Various types of cards and symbols were used—some with two choices, some with as many as 14. The most successful results were achieved with the 14-choice tests.

From Duke university came in 1940 two reports offering a further advance on the hypothesis of precognition or foreknowledge. These experiments were based upon the prediction of the order of ESP cards in a deck which will be shuffled or selected mechanically. One of these reports was by Dr. J. B. Rhine, and another, a thesis for the M.A. degree, by Miss Lois Hutchinson. Both authors hesitated to conclude that precognition is established, but regarded the evidence as increasingly favourable.

In spite of the war, England was the source of two reports of experiments in ESP. The first was by Whately Carington, who tested the ability of a large group of subjects in different parts of England and America as to their ability to reproduce drawings which he "exposed" in his study in a scheduled order. The drawings were chosen by random methods and the reproductions by the subjects were, along with the original drawings, turned over to a judge whose task it was to match them. He found that they matched to a better-than-chance degree. The fact that the subjects more often hit a drawing that had been exposed before or later than the one at which they were aiming at the time represents the outstanding feature of these experiments. This is called a "displacement effect."

The same effect was reported by S. G. Soal who was invited by Mr. Carington to look for the phenomenon in his card-guessing data. These data had been obtained by Mr. Soal in tests in which the subject had been asked to identify ESP cards (with five symbols: star, waves, square, plus and circle) which were held and looked at, one at a time, by an agent or sender screened from the subject's view. Again it was found that the subject's calls corresponded much better with the just-preceding or just-succeeding card than with the actual card he was attempting to call. This systematic scattering is itself a problem for further investigation.

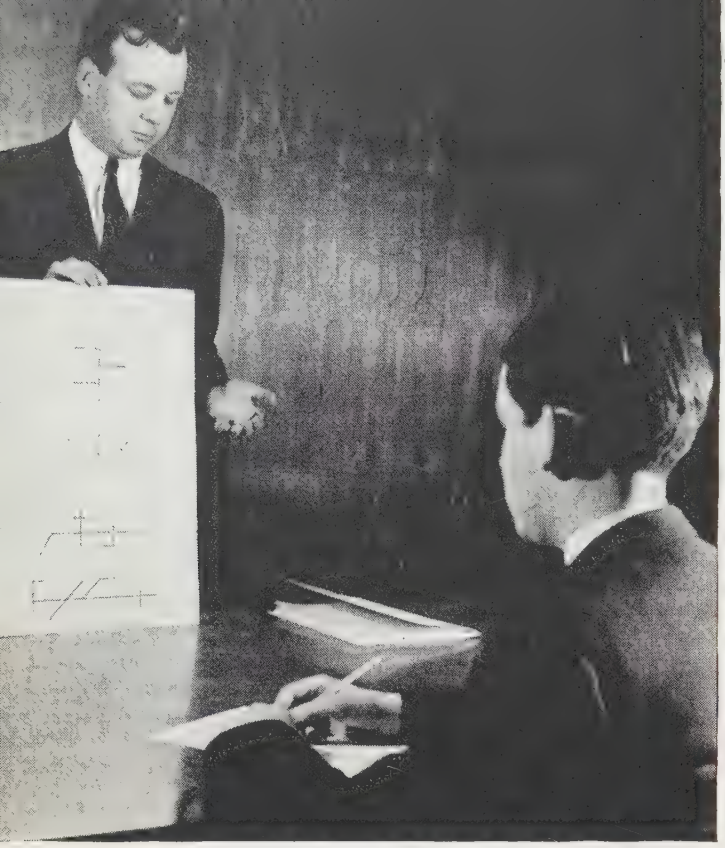
An important summary and review of the experimental evidence on extra-sensory perception appeared during 1940 in the volume *Extra-Sensory Perception After Sixty Years* by Rhine, Pratt, Stuart and Smith of the Parapsychology laboratory, and Greenwood, a mathematician, of Duke university. (*See* also PSYCHOLOGY.)

(J. B. R.)

Psychology.

The trend in modern psychology of giving as much attention to peripheral regions as to its own central areas continued during 1940. Thus on the physiological front psychologists were concerned with the effects of drugs and hormones, with the characteristics and correlates of the electroencephalogram (brain waves), with the results of the destruction of parts of the nervous system, and with the functioning of the sense organs. On the border line, where psychology meets the social sciences, problems of public opinion, propaganda, group conflict and the socialization of the child received the most consideration. Dispersed as were their labours in attacking the biological and social aspects of mind, psychologists did not abandon exploration of their traditional subject matter of learning, motivation and perception.

Motivation and Learning.—Modification of behaviour through learning again held the centre of the psychological stage. The important books of E. Hilgard and D. Marquis, C. Hull and G. Katona made available advances in research and theory. *Conditioning and Learning* is a critical summary of the experimental work on conditioning in relation to various aspects of the learning process. Hull's *Mathematico-Deductive Theory of Rote Learning*, a specialized treatment of associative learning, gives his system of 17 postulates, 54 theorems and 110 corollaries concerning serial position effects, reminiscence and forgetting, reaction



APTITUDE TEST conducted at Stevens Institute of Technology, Hoboken, N.J. After studying a set of designs for 12 seconds, the subject draws them from memory

thresholds and the curve of memorization together with their mathematical proof and degree of experimental verification to date. In contrast Katona's Gestalt emphasis in *Organizing and Memorizing* gives the central role to meaning rather than to mechanistic association. Katona marshals evidence to support the thesis that the understanding of organized wholes is the prototype of learning. On the whole, interest attached more to the motivating conditions underlying learning than to the mechanics of learning. The work of Gulliksen in seeking the exact equation of the learning curve with motivation held constant was being supplemented by experiments which measure the precise relation between amount of reward and degree of learning. Such experimentation showed that the rate of extinction of a learned act decreases as the amount of the original reward increases. Variability of reward has also been tested in the animal laboratory and the finding is that constant amounts of food, even though small, are more effective than variable amounts of food which half the time exceeded the constant reward.

An interesting motivational problem related to the externalization of such organic drives as hunger and sex. A whole theoretical structure has grown up on the assumption that the means to satisfy a drive become in time drives themselves. This notion of the functional autonomy of motives regards the internal drives as important only in the early years of life and insists on the independence of adult social goals as powerful incentives. Older experimental work failed to support the theory. For example, apes taught to work for chips, exchangeable for food through a machine, accumulated chips as long as they knew the chips had exchange value. But when the machine yielded no more food the apes lost their interest in working for chips. It was shown that rats, rewarded for learning a maze with food, learned a new maze without reward as rapidly as a control group of rewarded animals. Other evidence indicated that the means can turn into drives under certain conditions, the most important of which is the tying in of an additional source of stimulation to support the original habit or means employed. The functional autonomy of motives is thus more apparent than real.

Increasing attention was being given in the field of motivation and emotions to extreme excitement produced by frustration and conflict. In laboratory situations animals, when frustrated or forced to make a difficult if not impossible choice, will go into fits and sometimes into cataleptic states. This experimentally-produced neurosis is often regarded as the analogue of human nervous breakdown under conditions of stress and strain. It was hoped that work on the experimental neurosis might lead to a better understanding of the conditions of conflict responsible for nervous disorder and of the reactions to conflict which preclude breakdown. That the gap between neuroticism of the laboratory rat and the psychoneurosis of the human is great is indicated by the experiment of C. R. Adams. Human subjects who made neurotic scores on personality tests showed no greater susceptibility to frustration of a laboratory sort than stable subjects. Animal experimenters, following in the trail blazed by Liddell and the Cornell group, reported these conclusions:

(1) In rats the neurotic pattern is in good part an inherited affair. (2) If in conflict situations the animal can make some abortive response (a response which does not solve the problem but takes him out of the situation), he does not develop the neurotic pattern. (3) Measurable precursors of the final breakdown can be found in the activity level of the animal, startle pattern, respiratory changes and latency of response to the conflict situation. (4) The clinical dichotomy between normal and neurotic omits the quantitative gradations of behaviour which are related to degree of conflict or frustration and can be so studied in the laboratory.

The inheritance of temperamental differences in rats was confirmed by another investigation in which two strains of rats were selectively bred for seven generations. The animals of the emotional strain defecated and urinated frequently in test situations; the animals of the nonemotional strain showed few or no excretory reactions. Further study indicated that the emotional rats tended to be less aggressive, more active and slower in problem solution than the nonemotional rats.

Method.—A significant development during 1940 was the application of Fisher's principles of factorial design to psychological problems. The logic of this method utilizes the mathematics of small numbers and controls variability by the rigid design of the experiment in which variables are paired in an overlapping manner. Factorial design is particularly applicable to many psychological problems which present a large number of variables, which in older experiments were controlled only by the use of large numbers of cases—often an inadequate control in that selective errors are very common in working with human variables. Lindquist's volume, *Statistical Analysis in Educational Research,* translated Fisher's technical work for the average experimenter. Interest in the possibilities of the method, as evidenced by the round table on the subject at the annual meetings of the American Psychological association, presaged a revolution in the planning of psychological experiments.

Physiological Psychology.—The electroencephalogram, the electrical activity of the brain as recorded through the intact skull and scalp, showed characteristic changes from active waking states to sleeping states and in general from normal conditions of the organism to abnormal conditions. The recording of brain waves in relation to various psychological factors has become a standard type of experimentation. There is no constancy in individual pattern of brain rhythm between waking and sleeping states. The person who varies from the group in his waking encephalogram is not necessarily the individual who varies from the average in his sleeping encephalogram. The average adult pattern of alpha waves, moreover, does not appear consistently until about the age of eight or ten years. In another investigation, differences were found between the electrical brain activity of a group of normal and a group of behaviour-problem children. In general, however, the tendency is to break down the characteristic brain waves into their component elements to find out more about the real nature of these gross electrical records. Thus Bartley reported that electrograms of the rabbit's optic cortex reveal a specific cortical response to peripheral stimulation. This response does not so much block the alpha rhythm, as is some-

times assumed, as it disperses the activity rest-cycles of the alpha elements under conditions of constant or nearly constant visual stimulation. The alpha activity is not abolished by properly timed intermittent stimulation.

Upon the older foundation of knowledge concerning the general functions of major parts of the brain, newer techniques of extirpation and experimentation were building a detailed account of specific brain areas. Following are some typical findings: removal of the visual cortex in monkeys destroys daylight or cone vision leaving the animal with twilight or rod vision. Loss of the visual cortex does not prevent discrimination of flicker under conditions favouring brightness adaptation. Ablation of both frontal lobes, as Jacobsen demonstrated, destroys ability to solve problems involving immediate memory of several items, but Finan reported that operated animals, with the frontal or associational areas extirpated, can learn delayed discrimination if rewarded in a trial-and-error situation. Small lesions of the cerebral cortex do not change the cortical inhibitory function sufficiently to produce emotional behaviour. Similar lesions do not produce regressive behaviour, the return to earlier and less discriminating responses. Cortical injury must be fairly great to bring about the uninhibited emotional activity of the thalamic centres.

The study of the special senses, once the staple problem of the psychological laboratory, has become a highly specialized field since the development of elaborate electrical equipment for controlling stimulation and for recording responses. Phenomenological description and introspective protocols have given way to detailed study of physiological processes. Wever and Bray continue to apply their method of recording the action potentials from the auditory nerve and the cochlea to the study of auditory phenomena. In an investigation of combination tones through the electrical responses of the cochlea they found that two pure tones gave rise not only to their own harmonics but also to the sum and difference combinations of the two stimuli and their integral multiples. The summation tones had equal status in the response pattern with the difference tones and hence can not be regarded as difference tones of a higher order. The beat-tone theory and the overtone theory of difference tones must thus be discarded in favour of a transformation theory which emphasizes distortion in the inner ear. Investigators at the State University of Iowa were interested in the perception of human speech patterns which are rarely of a constant pitch even for short intervals. Hence they measured the relation between the perception of pitch and the rate and extent of frequency modulation in short pulses of sound. They found that the greater the change in extent of frequency modulation the greater the perceptible change in pitch, but the more rapid the rate of frequency change the less the perceptible change in pitch. Another type of approach is exemplified in the work of Neff who sectioned various amounts of the auditory nerve and then tested hearing. Very small lesions produced no demonstrable effect. Larger lesions caused a marked loss of hearing at the upper frequencies, but the lesion had to be very extensive to interfere with perception of low tones. In no case was there a loss for low or intermediate frequencies without greater losses for the high frequencies.

Social Functions.—A genuine advance in the psychology of social relationships has been the growth of neo-Freudianism. Disregarding allegiance to the Freudian system as an ideology, the neo-Freudians have concentrated on solving the problems, to which Freud called attention, on the basis of observation and research. In the course of this movement psychiatrists like K. Horney have contributed clinical observations on the relation of culturally-produced anxieties to personality development, experimentalists taking their cue from the Yale group have been putting concepts like regression and repression to laboratory test, and ethnological interpretation like that of Kardiner has been developing the functional basis of customs and institutions in the tradition of Malinowski.

Studies of regression showed that when animals are frustrated in their attempts to solve a problem they will fall back upon responses learned earlier as a solution to a simpler problem. Careful experimentation, however, failed to substantiate the notion of regression to earlier habits in a crisis situation as an invariable principle of behaviour. Regression to an earlier habit is in large part dependent upon the potency of the motivation under which this habit was learned. Laboratory evidence thus confirmed the Freudian doctrine that the early overfixation of the libido at a given developmental stage determines the type of regressive behaviour the individual will show when balked in adult adjustment. The importance of developmental history for later behaviour is also seen in Hunt's work on feeding frustration in infancy. A group of rats, limited in their feeding for 15 days during infancy, exhibited much more hoarding behaviour when put on controlled subsistence as adults than a control group not subject to feeding frustration during infancy. Another group, subject to similar feeding frustration at a later period in infancy, showed no carry-over in hoarding behaviour as adults.

Repression of ideas productive of anxiety was tested by Sears with two groups of subjects learning different lists of paired terms. The one list contained words judged by analytically-trained psychologists to be anxiety-inducing for most college students; the other list on the contrary contained words of gratifying connotations. No difference in recall was found either after 48 hours or three weeks. Clinical observation of memory loss due to repression still lacked conclusive experimental proof. Evidence for the Freudian hypothesis of displacement was at hand, however, in the study by White and Lewin of the effects upon children of democratic and autocratic group atmospheres. Hostility between group members decreases as hostility to outsiders increases; as hostility to the adult leader builds up, aggression among child members grows less; and expression of hatred toward an impersonal object releases tension developed toward a personal hate object. The Freudian doctrine that emotions are characteristically displaced on objects and persons, not the primary causal agents of the emotional arousal, has wide implications in problems of mass psychology.

Kardiner's description in his *The Individual and His Society* of two primitive cultures in terms of the interaction between the developing child and specific institutional pressures, especially familial, gave the student a genuinely dynamic account of personality. By replacing the orthodox Oedipus complex with an emphasis upon the child's dependency upon adults, Kardiner made possible a fusion between the psychology of the laboratory and the Freudian interest in the socialization process. Additional anthropological evidence came from Dennis' study of the Hopi child. Dennis bore out Malinowski's observations that resentment of authority and discipline rather than sexual jealousy is the main determinant of hostile attitudes which children develop toward adults. Hopi children faced with fewer prohibitions and frustrations are much less given to crying than American children. On the other hand the notion that feeding-frustration leads to thumb sucking and other nervous oral habits was definitely challenged by Hopi children who show such behaviour even though breast fed to the age of four.

Propaganda and Public Opinion.—Paralleling the interest in developmental questions was the attention given to public opinion and propaganda. Techniques for the measurement of public opinion were improved through the interaction of three types of research: the public opinion polls, commercial marketing investigations and the attitude experiments of the social psychologist. The public opinion poll showed the superiority of the interview over the mail ballot and otherwise improved methods for accurate sampling. The commercial researchers added practical insight into question wording and interview procedure. The psychologists stressed the intensity and motivation behind the expressed attitude. A product of the fusion of techniques is found in *Radio and the Printed Page,* one of the volumes summarizing the findings of the Princeton radio project, in which the psychological advantages of the medium of print over the radio for popular education are documented.

Trends in public opinion were being examined in relation to critical events and propaganda in a more systematic fashion than ever before. Representative cross-sections of the public were being polled regularly with standard tests. Psychological analysis of propaganda followed two lines of investigation: (1) collection of propaganda materials and their interpretation according to accepted principles of suggestion and emotional belief and (2) experiments on changes of attitude with different types of appeal and with various prestige accompaniments. The *Public Opinion Quarterly,* which completed its fourth year, was becoming more and more the meeting place for the public relations expert, the political scientist and the social psychologist. (*See* also PROPAGANDA.)

During 1940 appeared the first yearbook of the Society for the Psychological Study of Social Issues, a group organized in 1936 for the purpose of bringing psychological techniques and interpretation to pertinent social problems. The volume deals with industrial conflict and shows the role of attitudinal factors in clashes between employers and employees and between various groups of the workers themselves. (*See* also NERVOUS SYSTEM; PSYCHIATRY; PSYCHICAL RESEARCH; PSYCHOLOGY, APPLIED.)

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Psychology, Applied.

Applied psychology during 1940 gave striking evidence of the way in which war and preparation for war had invaded the lives of men everywhere. The usual ready interchange of technological information between countries was interrupted by censorship and by the difficulty—often impossibility—of sending technical journals through mail services that were badly overtaxed. What information did cross borders left little doubt that, the world over, those who had technological training in psychology were either already at work upon military problems or were holding themselves organized in readiness for such service. One commentator pointed out that applied psychology had celebrated its first birthday during the war of 1914–18 and that it had reached its majority during the international disturbance which began in 1939. Certain it was that many of the same psychologists who served in the World War of 1914–18 found themselves engaged for the second time in military service.

There were, however, striking differences between the two occasions, for many of the central techniques employed as routine in 1940 were unknown in 1918. The construction of tests, for example, leaned heavily upon correlational and factor analysis methods developed only since 1920. Statistical methods for deal-

ing with small samples made it possible in 1940 to investigate fields in which it was necessary to make statistical comparisons between small groups—a hopeless task in 1918. Techniques developed in industry for the selection, classification and training of individuals in skilled occupations were taken over bodily by the military establishments. In fine, where governments during the war of 1914–18 had been compelled to place most of their technological problems in the hands of those who had training only in "pure" psychology, there were available in 1940 specialists trained in dealing with practical psychological problems and armed with tested instruments and techniques suited to the problems before them.

Wartime concerns of psychologists were not, however, limited to dealing with questions involving the armed forces. Problems of civilian morale and of the analysis of propaganda fell within the proper scope of methods developed since the war of 1914–18. The techniques of the public opinion poll and of attitude-measurement were directly applicable to the study of public responses during wartime. With audiences running as large as 80,000,000 listeners to a single broadcast in the United States alone, the radio proved a natural object of study. A number of commercial organizations were sponsoring different ways of measuring the size of the listening audience. Centres for the analysis of broadcast content were established and arrangements were made for 24-hour listening posts to analyze short-wave broadcasts from other countries. The introduction of this new and powerful weapon for propaganda among civilian populations brought the problem of morale to the fore and re-emphasized the wartime use of psychological techniques developed in times of peace.

Accidents.—Although many of the published reports dealt with researches completed before the beginning of the war, there were already in print by the end of 1940 articles which pointed to the importance of accident-reduction during wartime. Analyses made in many countries agreed in demonstrating that accidents are not distributed through the population by chance but that a small group of accident-prone individuals continued to incur far more than its expected number of accidents. There have been many efforts to construct tests and batteries of tests to detect these individuals in advance but these have met with only mild success. They make it possible to reduce the accident-rate in commercial concerns which hire employees from a large pool of available personnel but are not of much help in deciding which automobile drivers to license, for example. In part, at least, this is due to the very complex causation of accidents and, in part, to the unsatisfactory reporting of accidents that characterizes the civilian population. One statistician reported a technique for arriving at the best possible prediction to be made from any such set of data and indicated that the best possible battery of tests for the accident-data under consideration could not reduce the error of estimate by more than about 10%.

Particular efforts were directed towards reducing the accident-rate in defence industries and on the highway. Changes in highway design had been shown to be of value only as they eliminated possibilities of errors in human judgment and performance. During 1940 there were reports of investigations dealing with improvements in headlights and in directional signs, all concerned with reducing the possible range of human failure. Other publications dealt with researches on the known causes of accidents, including such factors as alcohol, glare-sensitivity, age, fatigue and personality defects. The added strain of living under wartime conditions served only to emphasize the necessity of making provisions to eliminate every possible cause of accidents in the factory, on the highway and in the home.

Aviation.—Informal reports from all of the larger countries left no doubt that the selection, training and maintenance of aviators was a principal concern to applied psychologists during 1940. The fact that much of their research was being conducted under military auspices and accordingly not for general publication sharply curtailed the number of published articles in this field. Even so, the technical journals carried accounts of investigations in progress from Germany, England, Italy and the United States.

Experiments on the effects of reduced oxygen uniformly pointed to the harmful psychological effects of high-altitude flying without an oxygen mask. It was shown that lack of oxygen above critical altitudes resulted not only in reduced skill in handling the controls but brought about as well impairments in judgment which were not less serious. These effects were found to shade over into complete loss of consciousness in higher altitudes.

There were studies of the "black-out" under heavy deceleration such as is encountered in dive-bombing. Special efforts were made to develop tests to differentiate men according to their suitability for the specialized tasks of military aviation. The broadest approach was being made in the United States, where more than 20 universities were co-operating in a program of research sponsored by the National Research council in connection with the training of more than 50,000 aircraft pilots under the Civil Aeronautics administration. Topics of investigation in this program ranged from the initial selection of pilots through to the study of their behaviour in the air and involved for the first time the objective recording, during flight, of the responses and reactions of novice pilots.

Industry.—The year in industrial psychology was characterized by emphasis on the social aspects of employment. The term "job satisfaction" appeared as the central concern in many articles and there was published a handbook which dealt entirely with studies of industrial conflict. There were additional reports dealing with the necessity of adjusting the formal organization of an industrial plant to take account of the informal social organizations that spring up spontaneously among the workers. The representative of one industrial concern reported that his company had found it valuable to set up a counselling system to bridge the gap between formal and informal organizations. Informal reports were available from other companies which were supporting further intensive studies of such organizations within their plants. Upon this general background, one organization reported that time and motion study techniques, usually opposed bitterly by organized labour, could be used profitably under collective bargaining, provided the workers involved retained a power of veto and a provision for individual adaptation.

Military.—The very nature of the investigations in this field operated to keep much of the research under way from being reported. In spite of the pressure for secrecy, there were published reports from at least five major countries. Two ominous articles from Spain dealt with the vocational readaptation of those crippled by war. It was known that psychologists in all of the larger countries were being asked to aid in the selection of those best suited for military service and in the classification of these men for specialized duties within the armed forces. A report was available on military selection during the Spanish war. From England came a reminiscent summary of studies conducted in 1915–18 on problems of selection and maintenance of personnel in munitions factories. In the United States a committee representing all of the national psychological organizations was formed to make the professional services of their members available to the government during the international emergency.

Vocations and Occupations.—Researches continued to point to the wide disparity between occupational opportunities and occupational choices of adolescents, their choices showing a tragically heavy weighting towards the "white collar" occupations. There was increasing emphasis on the necessity for broad-scale and long-time programs in vocational orientation. One important step in this direction was the publication by the United States department of labour of a dictionary of occupational titles, containing titles and summaries of duties for more than 18,000 jobs. This makes possible considerable gains in "horizontal classification"—a classification of jobs in terms of their psychological requirements, cutting across arbitrary occupational boundaries. (*See* also PSYCHOLOGY.)

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Public Health Engineering.

Air Sanitation.—With increasing knowledge of the bacteriology of the air of occupied rooms has come a more general acceptance of the once discredited view of air-borne infection. Public health thought appears to be, "air-borne infection is possible, probably does occur, but how often, and how widely?" Cruickshank and Muir, for example, observed a secondary streptococcal infection in a military hospital ward and concluded, after elimination of other possibilities of spread, that the infection was in fact air-borne.

In the home, one offset to air-borne infection is natural ventilation by means of flues and exhaust ducts, or even by leakage through windows, doors and walls. Ventilation, expressed as number of air changes per hour, is measured by adding gas, such as hydrogen, and noting the rate of its disappearance.

Experiments by Warner have shown so simple a device as a flue or air grating will ordinarily provide between one and two air changes per hour, while with flue tightly sealed, the ventilation due to leakage is 0·8 change per hour. These volumes depend upon size of rooms and of flue opening, wind velocity, outside temperature and tightness of windows and doors. The recommended standard—a minimum of 600 cu.ft. of fresh air per hour per occupant, may readily be obtained by flues, without fires, or by air gratings of proper size.

A result equivalent to ventilation brought about by some germicidal treatment may be conceived. Wells thus defines sanitary ventilation. Ultra-violet light is still being tested experimentally under an increasingly wider range of conditions. Other methods of room disinfection are likewise under investigation. The employment of "aerosols," fine mists of a liquid disinfectant, has received attention, especially in England. The effects of normal daylight and sunlight within homes is being investigated from the same point of view at Columbia university, with significant results.

Housing.—Man's two prime requisites are food and shelter. The political crises of 1940 brought both these matters into sharp focus. Air-raid shelters and bombed homes present new problems to the health authorities: problems of emergency crowding and of environmental sanitation under extreme conditions. Perhaps nowhere in the entire field of civil government have the advantages of preparedness been better exemplified. Through study and research, sanitarians are possessed of far more knowledge of the causation and prevention of diseases than it has yet been practical to teach or to employ. They are thus prepared to fulfil their obligations under conditions of stress. Despite scant information, important dividends are being paid in the form of lives saved, upon past investments in the field of public health.

In the United States the problems are rather those of new housing developments in relation to expanding war industry. In this instance also, the knowledge of the past is being heavily drawn upon, and emergency housing is merely the application of well thought out principles of good housing under normal conditions.

Water Supply and Sewerage.—Chlorination of water supplies has become a well-nigh universal treatment. Objectionable taste and odour have at times hampered its proper application. Various remedies have been proposed and in particular overchlorination has been avoided. A more satisfactory procedure is now available in the newly-developed "break-point chlorination." This goes to the opposite extreme. Increasing dosage increases residual taste up to a certain point, the break-point. At that point chlorine demand suddenly drops, the tastes and odours disappear.

A new water supply problem is posed by recent studies relative to poliomyelitis. The virus is recoverable from the stools of patients, convalescents and healthy contacts, and from city sewage below epidemic areas. The disease may be given to certain species of monkeys by the oral route.

What meagre information there is on the life history of the virus outside the body indicates that it would be adequately controlled by ordinary pasteurization procedures in milk and that it is killed by concentrations of chlorine in water somewhat greater than those commonly employed. With no suggestion that water or milk carriage is a common mode of transmission during epidemics, these newer discoveries do place added responsibility upon water supply authorities.

The water supply of an army, whether in fixed camp or on the march, is a pressing problem in military engineering. To supply water in a fixed army post calls merely for an adaptation of the principles of town supply. More critical are the problems of the army on the march or in temporary field quarters. In the latter case 25 to 35 gal. (U.S.) per man is considered necessary in the American army; in the former, two gallons is an adequate allowance. A mobile purification unit weighing about 700 lb. and having a capacity of 12 to 15 gal. per minute was used in the 1940 army manoeuvres with every satisfaction. It employs filtration through sand and hypochlorination.

Aviation and Disease Transmission.—The shortening of time schedules and extension of continuous flight routes by aeroplane present new problems to the health administrator. One of these is the danger of introducing a case of a disease during its incubation period. In yellow fever, for example, the incubation period of six days guaranteed that exposure in a foreign port would develop en route and be reported on arrival. Now infected contacts may develop after arrival. Quarantine regulations must keep all suspects under surveillance for the full incubation period. A second problem relates to the importation of live mosquitoes, possibly infective. An examination of 398 planes arriving at the port of Miami, Fla., in 1938, disclosed a total of 651 insects, of a dozen or more genera, including five live and 40 dead mosquitoes of many species. The sanitary control of the area about the airport includes measures against mosquito breeding facilities.

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Public Health Services.

In the development and expansion of public health services in the United States of America, it is not the aim of the federal government to undertake medical care in the sense of abolishing the free practice of medicine and bringing it under federal control, *i.e.*, in establishing so-called "state medicine"; but rather to reach an arrangement, under the democratic form of government, whereby not only full public health protection, but medical and hospital needs as well, of all the people can be met. This aim was fully endorsed by the American Medical association as set forth in its platform announced in 1940. With the sombre shadows of war darkening Europe, little advance in public health activities was recorded in European countries during 1940, except the changes in and the intensification of such measures as were necessitated by war conditions. At the same time, conditions unfavourable to health became increasingly serious. Prior to the outbreak of the war, many of the small invaded nations had modern and progressive health organizations. Of the fate and activities of these organizations in 1940, little is known.

Great Britain.—Before the beginning of the war in western Europe, the mobilization of medical and public health services had already begun in Great Britain and France. The general health conditions in these countries had never been better. Health authorities of Great Britain state that, although the war had an accelerating effect on efforts made to protect and improve

the health of the people, the satisfactory health situation after several months of war was attributed more to effective public health services during the years preceding the war than to the care exercised since the war began.

France.—The call of physicians to military duty in France before and during the war, left many towns and country regions without medical services. In meeting the health problems created by the war, the French government, before the armistice, in 1940, undertook the extension of health services by means of especially equipped trains of 16 to 18 coaches each, designed for rapid application of prophylactic measures to large numbers of persons, both evacuated civilians and the military.

Finland.—As the result of recent studies, endemic goitre is believed to be a national problem in Finland. The characteristic feature of the disease there is the high frequency of adenomatous thyroids, demonstrated in nearly 100% of the cases. Universal prophylaxis is not to be undertaken, however, until further observations have been made of the results, in later adult life, of iodine prophylaxis in childhood in Switzerland.

Germany.—Early in 1940 Germany adopted regulations for medical practice during the war, including the establishment of physicians' fees. This was stated to be a war measure, however, and did not indicate the intention of the government to socialize the profession.

As in Great Britain, diphtheria immunization has not been sufficiently general in Germany to achieve outstanding results. In fact, diphtheria morbidity and mortality have been increasing there since 1933, although the case fatality rate has declined. In 1933 there were 75,000 cases of diphtheria in Germany, as compared with 150,000 cases in 1939.

Italy.—The minister of health of Italy issued a circular in 1940 regarding the control of communicable diseases, setting forth the measures to be employed and establishing the period of quarantine. Since anti-tuberculosis centres were established in Italy in 1927, the death rate from tuberculosis dropped from 147 per 100,000 to 80. Similar declines in the disease, however, were also reported from most other countries. In 1939, the Italian social insurance covered both insured workers and their families, and 57,000,000 days of hospitalization had been given during the first 10 years of this insurance plan. Late in 1939 a law was adopted in Italy prohibiting persons having a contagious disease from entering domestic service. All such servants must pass a medical examination (free) at specified intervals.

Rumania.—In Dec. 1939, the minister of health of Rumania appointed a technical committee to study public health problems and make recommendations regarding urgent matters needing attention. Besides specific diseases, the subjects include malnutrition and deficiency diseases, maternity and child welfare, eugenics, and dental conditions.

Australia.—During 1940, the commonwealth and state health authorities of Australia conducted a national health educational campaign through the press, radio and cinema, supported by the local branches of the British Medical association, the especial object of which was to inform the public of the preventive and curative medical services available and to stress the importance to the nation of preserving a high individual health standard. An amendment was passed in 1940 making more strict the laws governing abortion. Contract medical practice as a private enterprise, initiated by physicians on the community plan and voluntary basis, was begun in Australia in the latter part of 1939. The proposal for national health insurance was abandoned in Australia in that year.

New Zealand.—New Zealand, with slightly more than 1,000,000 population, experimented with socialized or state medicine, under the control of the department of health, which administers the Social Security act of 1938. This act provides for medical treatment and hospital care and "such other benefits as may be necessary to maintain and promote the health and general welfare of the community." The benefits are available to all persons. Funds for certain health purposes are raised by local charities.

Canada.—In Canada, efforts were made during 1940 to strengthen and expand official public health agencies. Many private and voluntary health agencies were discontinued, having been deprived of both workers and financial support as the result of the war. With the need for new economics, public health services were being revaluated, accompanied by an extra effort to avoid the lessening of fundamental health activities.

U.S.A.—In the United States of America, the federal government, through the Public Health service, continued federal aid to the states in strengthening and expanding their health organizations. In research, a protective vaccine against epidemic typhus fever was developed which proved successful in experimental animals and the possibility of developing effective immunization against pneumonia was demonstrated; tularemia infection was found in Montana streams, and poliomyelitis was induced experimentally in a species of rat and the white mouse, thus providing cheap experimental animals for poliomyelitis research. A research unit in gerontology was organized at the National Institute of Health in 1940, which will conduct studies on the biology of senescence and on diseases, mental and physical, characteristically associated with advancing age.

Non-profit voluntary medical care programs were being tried out in several cities, and various group hospitalization schemes were in effect throughout the United States. Experience with these programs shows that frequent changes have been necessary in fees and the limitations of services.

Increased activities were recorded in the state health departments in industrial hygiene, venereal disease, cancer, tuberculosis and pneumonia control programs.

Voluntary medical care programs for low-income farm families, instituted in 1936, by the Resettlement administration in co-operation with the state medical societies, covered nearly half a million individuals in 1940. A federal bill authorizing six annual appropriations of $10,000,000 each to provide hospitals in rural and economically depressed areas was reported favourably during 1940 but was not brought up for vote.

The principal advances in public health services in the Latin-American countries of the western hemisphere during 1940 were represented by the strengthening of health administrations, the increase in the number of trained personnel, the promulgation or modernization of sanitary legislation, the increase in hospital and research facilities and the increase in health budgets. There was also a definite tendency to provide greater stability of tenure for health officials. One indication of the effectiveness of improved sanitary services in the Latin-American republics is the general freedom of all important sea- and airports from pestilential disease during 1940 permitting unrestricted communication among all countries of the western hemisphere.

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Public Utilities.

Early in 1940 (Feb. 28) the Securities and Exchange commission began its long awaited action in issuing "show cause orders" for the integration of holding companies in conformity with section 11 of the Holding Company act, the well-known death sentence section. Nine of the larger holding company systems were required to file statements and plans as to their position and steps to be taken in conforming to the provisions of the act, which limited operations to "a single integrated public utility system and to such other businesses as are reasonably incidental or economically necessary or appropriate to the operation of such integrated public utility system." Corporate assets involved in these activities were estimated to exceed $14,000,000,000. It was certain that these efforts on the part of the commission to make headway on its most important and difficult assignment would provide grist for its administrative mill for years to come. The details to be encompassed were technical in an engineering, legal and financial sense; they were individual to each property and the result of historical growth; they could be ascertained only upon painstaking investigation because the facts were often obscure and their economic implications in relation to the legislative standard imposed were only dimly perceived by those who drafted the law and by its legislative sponsors. If the sprawling holding company systems operating through many states were to receive permission to operate more than one integrated system, they must be prepared to show that each additional system could not be operated as an independent system without loss of substantial economies and that their common control did not impair localized management or the effectiveness of regulation. The task would prove a severe test of the efficacy of the administrative machinery.

Federal Communications Commission.—During the year 1940 the Federal Communications commission supplemented its earlier report favouring integration of domestic telegraphic communications with a similar favourable report recommending merger of international telegraph service to embrace both cable and radio facilities. The report was addressed to the Senate Interstate Commerce committee in connection with a study of the entire telegraph industry. The commission was unanimous in suggesting complete monopolization of the domestic business, but divided on the international end, the minority contending that the complete abandonment of competition between cable and radio services would retard technical advances. The majority, however, was convinced that national interests in defence and in providing a more effective device for securing equitable communication arrangements with foreign administrations would be best served by the merger method.

Federal Power Commission.—The United States supreme court handed down the most significant decision affecting the respective jurisdiction of the states and of the Federal Power commission over navigable waterways in many years. In the Appalachian Electric Power company case, the majority of the court over two dissenting justices held that even though a river is not navigable naturally and no improvements are contemplated, the river may be classified as navigable if it can be made so by "reasonable improvements." Under the interstate commerce clause the authority of the federal government is not limited merely to considerations of navigation, but flood control, watershed development and recovery of the cost of improvements through utilization of power are likewise to be considered as a part of control over interstate commerce. Riparian owners' rights and the powers of state legislatures, 41 of which had joined the power company in fighting the Federal Power commission in its attempt to compel federal licensing, were thus made subordinate to the federal "domination over the water power inherent in the flowing stream."

National Defence.—The requirements of the national defence program for power occupied the centre of attention during 1940. With the growth in power demands for the munitions industries, private enterprises as well as public agencies were expanding their power facilities. With 1,850,000 kw. of capacity installed during 1940, the power industry was looking forward to further expansion in excess of 4,000,000 kw. during the ensuing year. A record-breaking output of 144,600,000,000 kw.hr. was achieved during 1940, with the maximum weekly output exceeding by 60% the maximum weekly output for the year 1929.

Federal Projects.—The incidence of the national defence program could be observed best in connection with federal projects, particularly in the appropriations recommended by the president. The TVA was allotted the giant's share with a total of $76,484,000 in reappropriated earnings, proceeds from bond issues and a federal appropriation of $69,800,000. This project, with current completions of three dam projects, was operating a seven-dam system of its own construction, was proceeding with the construction of three additional dams on the navigable portion of the Tennessee river, a new storage project on one of the upper tributaries and a new steam plant to firm up secondary power.

In the Pacific northwest there was completed and energized during 1940 a 235-mi. transmission line connecting Bonneville dam with Grand Coulee dam at a cost of $4,000,000. Federal budget estimates allotted $7,170,000 to the army engineers for additional generator installations at Bonneville dam and $12,958,500 for distribution facilities to market the growing power output under a new arrangement for joint marketing of Bonneville and Grand Coulee power. Expenditures on the Grand Coulee project were to be held down to $8,000,000 to complete the dam and provide installation of initial power units. For the time being, projected work on the gigantic pumping plant and irrigation works was to be shelved.

The amounts saved on the Coulee project were to be employed in expanding power facilities elsewhere. Parker dam on the Colorado river was to receive $6,000,000, the Central Valleys project in California was to get $25,000,000 and the Colorado-Big Thompson project was to have $2,900,000. Minor expenditures were likewise to be employed in completing the Fort Peck project for power production and transmission facilities.

With the sale by Alabama Power company of its northern Alabama properties to TVA and co-operating public agencies for $4,600,000, the TVA brought to a successful issue its plans for acquisition of an integrated power market. The financial effect of these acquisitions upon TVA power operations appeared from the agency's report for the fiscal year ending June 30, 1940. Covering wholesale operations only, it reported gross sales of $15,285,000 and a net return after expenses, depreciation and tax equivalent to $5,855,000. This represented an earning rate of 3·6% upon the investment in power properties of $160,718,000, including a 40% allocation to power of jointly used facilities. Of the total electric output of 2,600,000,000 kw.hr., nearly 1,700,000,000 were sold through 75 municipalities and 35 co-operatives to more than 400,000 retail customers.

St. Lawrence River Project.—The prosecution of the war appeared to have removed some of the objections entertained by certain authorities in Canada to further activity on the St. Lawrence seaway and power project. Upon the initiative of the president, the sum of $1,000,000 was allotted to the Federal Power commission and the army corps of engineers from the special defence fund for preliminary borings and studies on the International Rapids section of this joint navigation and power project. A special commission was appointed to supervise this work and to prepare in collaboration with a similar body from Canada a new plan for this project which should embrace not only power development and navigation works in the international section, but also works to preserve the scenic beauty of Niagara Falls and the levels of the Great Lakes. It was certain that these revised plans would envisage expenditures considerably in excess of the $250,000,000 contemplated by the original project which the senate rejected in 1932.

Hetch-Hetchy.—A final item involving federal projects grew out of a decision by the federal courts which held that the city of San Francisco's contract with the Pacific Gas and Electric company for the distribution of Hetch-Hetchy power was not an agency contract but a sale of power for resale in violation of the Racer act. In order to dispose of this by-product power in a manner which would satisfy the provisions of this act, a new contract was being negotiated with the approval of the secretary of the interior whereby the city will lease the distribution system within the city and operate it as a public agency, with the company supplying additional power requirements and acting as a standby source of supply.

Other activities looking towards the expansion of public ownership were taking place in Oklahoma where the Grand River Dam authority had begun the production of power; in South Carolina where the Santee-Cooper project was being speeded up for national defence purposes and negotiations were on foot for the public purchase of the disjointed power properties of the Associated Gas and Electric system; in Nebraska where a consumers' public utility district completed the purchase of certain private utility systems and was negotiating for additional power markets in which to dispose of power from federal products.

Private utility systems were not idle and they were taking full advantage of the favourable money market in refunding capital issues and floating new ones at money rates which were setting new records in the cheapness of capital supply. Rate reductions were continuing in response to commission and consumer pressures, but it was noteworthy that the number of such reductions slowed up as compared with the rate concessions of 1939. The lower rate levels in the case of electric supply produced a national average consumption in residential service of 952 kw.hr. per annum, the highest in the history of the industry. (*See* also ELECTRICAL INDUSTRIES; LEGISLATION; TENNESSEE VALLEY AUTHORITY.)

(M. G. G.)

Publishers' Prizes: *see* LITERARY PRIZES.

Publishing. The number of book titles issued in the United States during 1940—11,328—was the largest since 1920, according to records of the *Publishers' Weekly*. The year's output was also possibly the largest in the history of U.S. publishing, although comparable figures prior to 1920 are not available. Macmillan again led the roster of U.S. publishers with 469 titles, followed by Grosset & Dunlap (370), Harper (271), Doubleday, Doran (210) and Oxford (181).

During the year, 263 publishing houses issued five or more books apiece. Table I gives a breakdown of all 1940 books according to classification of subject.

Best Sellers.—Any list of best sellers is subject to such qualifications as book-club sales, publication late in the year, and discrepancies between wholesale and retail sales. According to the percentage analysis of the *Publishers' Weekly*, Richard Llewellyn's *How Green Was My Valley* was the best-selling novel of 1940 with 176,280 copies sold, none by book clubs. Christopher Morley's *Kitty Foyle*, published in 1939, was second on the fiction list, and *Mrs. Miniver*, by Jan Struther, was third with 242,000 copies, including 150,000 book-club sales. Ernest Hemingway's *For Whom the Bell Tolls*, not published until Oct. 21, 1940, was fourth with 440,000 copies printed, including book-club

Table I.—*U.S. Publications*

	For 1939			For 1940			Net Change
	New Books	New Editions	Total	New Books	New Editions	Total	
Philosophy	91	11	102	99	11	110	+ 8
Religion	669	28	697	781	62	843	+146
Sociology, Economics	773	81	854	796	80	876	+ 22
Law	138	25	163	141	61	202	+ 39
Education (books on)	293	22	315	317	32	349	+ 34
Philology	256	30	286	274	45	319	+ 33
Science	422	101	523	398	95	493	− 30
Technical books	336	116	452	470	141	611	+159
Medicine, Hygiene	307	124	431	326	146	472	+ 41
Agriculture, Gardening	100	29	129	108	31	139	+ 10
Domestic Economy	84	16	100	70	24	94	− 6
Business	298	59	357	344	58	402	+ 45
Fine Arts	262	26	288	213	9	222	− 66
Music	111	13	124	115	9	124	...
Games, Sports	190	29	219	156	26	182	− 37
General Literature	511	73	584	466	70	536	− 48
Poetry, Drama	580	73	653	671	67	738	+ 85
Fiction	1,133	414	1,547	1,221	515	1,736	+189
Juvenile	830	119	949	852	132	984	+ 35
History	708	96	804	783	70	853	+ 49
Geography, Travel	296	61	357	262	46	308	− 49
Biography	557	71	628	569	78	647	+ 19
Miscellaneous	70	8	78	83	5	88	+ 10
Total	9,015	1,625	10,640	9,515	1,813	11,328	+688

copies. Next were *The Nazarene,* by Sholem Asch (1939); *Stars on the Sea,* by F. van Wyck Mason, and *Oliver Wiswell,* by Kenneth Roberts. More than 300,000 copies of Roberts's novel, published Nov. 22, 1940, had been printed by the end of the year without benefit of book clubs. *I Married Adventure,* by Osa Johnson, was first on the non-fiction list with more than 200,000 copies sold, including sales of book clubs. Mortimer Adler's *How to Read a Book* followed with 72,000 copies sold. Third was *A Smattering of Ignorance,* by Oscar Levant; fourth, *Country Squire in the White House,* by John T. Flynn; fifth, *Land Below the Wind,* by Agnes Keith (1939); sixth, *American White Paper,* by Joseph W. Alsop, Jr. and Robert Kintner; seventh, *New England: Indian Summer,* by Van Wyck Brooks.

Book Fairs.—The leading fair in 1940, as in 1939, was that of Boston, sponsored by the Boston *Herald* and attended by approximately 50,000. Other fairs were held at Minneapolis, Minn., Hartford, Conn., Richmond, Va., New Haven, Conn., Rochester, N.Y., Northampton, Mass., Brattleboro, Vt., Manchester, N.H., and other cities. The New York city book fair was not held in 1940.

Great Britain.—The British book trade withstood the economic ravages of war in a remarkable manner during 1940. The decrease of 28% in new books and new editions was small enough under the circumstances. Table II, compiled by the *Publishers' Circular and Booksellers' Record* of London, provides some arresting statistics on reading habits in wartime.

The night of Dec. 29, 1940 was a sad one for the British trade. The great German incendiary raid of that night destroyed Stationers' hall, the historic centre of London publishing, and left Paternoster row a smoking mass of rubble. Approximately 4,000,000 volumes were burned in Stationers' hall alone. (J. V. Do.)

Table II.—*British Publications*

	For 1940			New Editions, 1940	Totals for 1940	Totals for 1939
	New Books	Translations	Pamphlets			
Philosophy	129	6	14	20	169	225
Religion	475	17	81	63	636	819
Sociology	445	21	216	54	736	1,106
Law	73	1	42	49	165	276
Education	101	1	8	14	124	265
Military, Naval	143	4	59	40	246	254
Philology	131	..	6	13	150	295
Science	378	4	32	78	492	722
Technology	321	2	59	111	493	677
Medicine, Public Health, etc.	221	9	43	106	379	525
Agriculture, Gardening, etc.	91	1	26	22	140	239
Domestic Arts	67	..	15	5	87	111
Business	49	1	4	12	66	130
Fine Arts	148	4	7	10	169	321
Music (books on)	39	..	3	6	48	73
Games, Sports, etc.	61	3	6	15	85	219
Literature	248	8	8	39	303	376
Poetry and Drama	186	11	36	53	286	491
Fiction	1,453	43	..	2,028	3,524	3,984
Juvenile	558	7	143	249	957	1,565
History	377	27	27	59	490	622
Description and Travel	275	10	7	81	373	619
Geography	28	..	2	3	33	78
Biography	315	22	14	78	429	720
General Works	151	..	..	1	152	201
Totals for 1940	6,463	202	858	3,209	10,732	14,913
	7,523					
Totals for 1939	10,884			4,029	14,913	

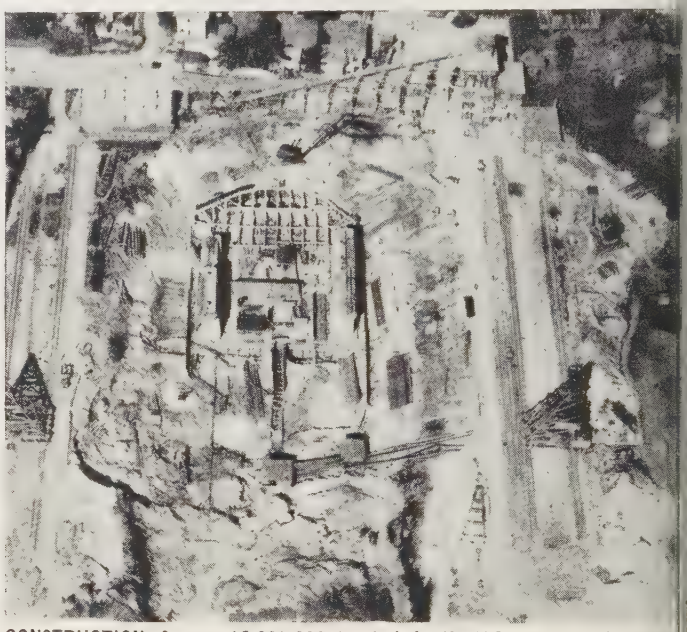
Puerto Rico, a United States insular dependency in the West Indies; languages, English and Spanish; capital, San Juan; acting governor, Hon. C. Gallardo. The land area, including adjacent and dependent islands, is 3,400·6 sq.mi.

The 1940 census gave the population as 1,869,255, with 30·3% urban, 69·7% rural. Whites aggregated 76·2%, Negroes 23·8% (1930: 74·3% white; 25·7% Negro). Nine cities had populations over 10,000: San Juan, 169,247 (a 47·5% increase); Ponce, 65,182; Mayagüez, 50,376; Caguas, 24,377; Arecibo, 22,134; Río Piedras, 19,935; Guayama, 16,913; Bayamón, 14,596; Aguadilla, 13,468.

The density of the population is 544·2 per square mile.

History.—Puerto Rico is governed by a governor appointed by the president of the United States, and an elected bicameral legislature, and is represented in the United States congress by an elected resident commissioner. In Nov. 1940 Rear-Admiral William D. Leahy, governor since Sept. 1939, resigned, and Hon. C. Gallardo, executive secretary of the government, became acting governor pending appointment of a new executive.

In April 1940 the question of the future political status of the island came to the fore when the United States congress was asked to admit Puerto Rico to statehood. Within Puerto Rico three political parties merged as the Unification party in order to further the movement for a referendum on statehood. The radical Nationalist party, however, remained intransigently aloof and continued its agitation for complete independence. Its membership was held responsible for the attempted assassination of the speaker of the insular house of representatives in September, the third political assassination attempted in three years.



CONSTRUCTION of a new $3,000,000 dry dock for the U.S. navy near San Juan, Puerto Rico, progressed rapidly in 1940

Meanwhile the United States quickened the tempo of its defence preparations in Puerto Rico. Despite vigorous opposition by the Nationalists, registration for compulsory military service was carried out in due course. Realization of Puerto Rico's strategic importance in defence of the Caribbean area and the Panama canal brought extended development of facilities to take care of defence needs. Construction of Isla Grande naval air base in San Juan harbour was begun, and Borinquén army air field, 75 mi. distant, was enlarged. Two other army air bases near Ponce and near San Juan were likewise being constructed. Development of port facilities and other defence measures were speeded. From less than 1,000 men on July 1, 1939, the number of United States troops in Puerto Rico was expected to exceed 20,000 by Jan. 1941.

The question of wage and hour standards in the needlecraft industry continued to be a sore problem, as employers threatened to close down rather than accede to the provisions of the United States Wages and Hours act. Temporary compromise settlement served only to postpone a final decision until 1941.

The economic situation in Puerto Rico improved markedly in 1940, largely because of defence pay rolls. Bank deposits increased by 33%, while government revenues for the fiscal year ending June 30 reached $16,867,932, an excess of $4,567,932, or 36.8%, over original estimates. Temporary suspension of the sugar quota system in late 1939 not only increased sales, but also removed a 170,000-ton surplus. Exports of rum to the United States likewise increased.

Education.—In 1940 Puerto Rico had 1,773 public day schools with 286,098 enrolment. The University of Puerto Rico (enrolment 5,869, 1st semester 1940–41), already an important cultural link between the Americas, was in process of development as a major centre of inter-American cultural exchange. The budget for 1939–40 allotted $5,470,516.66 for education.

Trade and Communication.—Puerto Rico has daily air transport communication with the United States and southward to Panama. Frequent, regular steamship sailings connect the island with other parts of the West Indies and with the United States. There are 387 mi. of railway and a main highway system of 1,487 mi., supplemented by local roads. The insular government owns and operates 1,900 km. of telegraph and 3,157 km. of telephone lines (17,417 telephones).

Exports in the fiscal year 1939–40 totalled $92,347,242, of which 98.4% went to the United States. Imports aggregated $107,030,482, of which 94% was of United States origin. The chief exports were: sugar and molasses (62.82%); needlework (16.9%); manufactured and unmanufactured tobacco (6.6%); rum (6.03%); preserved and fresh fruits (1.6%). The principal imports from the United States were edible products (25.9%); textile fibres and manufactures (17.57%); machinery and vehicles (9.38%); metals and other manufactures (8%); chemicals (7.57%).

Agriculture and Manufactures.—Puerto Rico is primarily agricultural, with a total of 55,217 farms (1940). Agriculture provides employment for 180,000 persons. In 1939–40 production included 1,018,803 tons of sugar; 18,369,849 lb. of tobacco; 23,098,000 lb. of coffee (almost entirely for intra-island consumption); 325,000 boxes of grapefruit; 630,000 crates of pineapple; and 12,898 cwt. of cotton.

Manufacturing is limited, with only the needlework, rum and tobacco industries supplying extensive manufactured goods for export. Rum exports, supplying two-thirds of United States demand, totalled $5,568,476 in value in 1939–40. Manufacturing and mechanical industries employed 96,148 persons in 1940.

Finance.—The monetary unit is the United States dollar.

(L. W. Be.; L. C. De A.)

Pugilism: *see* Boxing.

Pulitzer Prizes: *see* Literary Prizes: *United States;* Theatre.

Pulp Industry: *see* Paper and Pulp Industry.

Purdue University, at Lafayette, Ind., is Indiana's Land Grant institution, created under the Morrill Act of Congress of 1862, granting to each state public lands for the establishment of a university for the teaching of "agriculture, science, and the mechanic arts." Enrolment as of Oct. 1, 1940, was 6,967, divided as follows: all engineering, 2,487; agriculture, 842; pharmacy, 181; science, 918; home economics, 898; physical education, 137; graduate students, 456. For some years Purdue has had the largest engineering enrolment of any institution of higher learning in America. The faculty and staff number more than 900.

Research work on the campus was being expanded in the fields of agriculture, engineering, science and pharmacy. New investigations of importance were in progress in the field of physics with the cyclotron or "atom smasher"; commercial exploitation of the important research on the nitration and chlorination of hydrocarbons was of great value to industry and employment. Basic research was continued in many fields with private and governmental agencies, particularly in the defence program of the nation. The university continued its flight training under the Civil Aeronautics authority.

The Hall of Music with 6,208 seats was dedicated May 3 and 4, 1940, and the Memorial Union building, one of the most complete in America, was greatly enlarged through completion of three additions. Construction also was under way on additions to the airport hangar, electrical engineering and agricultural engineering buildings, and a new physics building was started. Buildings on the campus and adjoining farms in 1940 numbered 74.

During the year a total of 42,936 persons attended the 86 conferences of short courses held on the campus, representing a far-flung service to the state.

Pusey, William Allen (1865–1940), U.S. dermatologist, was born in Elizabethtown, Ky., Dec. 1, and was graduated from Vanderbilt university in 1885 and from the medical college of New York university in 1888. He engaged in practice the next year and in 1894 was made professor of dermatology in the college of physicians and surgeons of the University of Illinois, holding the post until he was retired as professor emeritus in 1915. He was president of the American Medical association in 1924–25 and of the American Dermatological association in 1910. He died in Chicago, Aug. 29.

Pyrite or Pyrites. World production of pyrite in 1938 reached 10,000,000 metric tons but declined slightly in 1939. Spain is normally the leading producer, but the industry suffered heavy declines during the Spanish civil war and was temporarily surpassed by Japan. In the next rank of producers with outputs of 500,000–1,000,000 tons, are Norway, Italy, the soviet union and the United States; in the 100,000–500,000 ton group are Cyprus, Germany, Portugal, France, Greece, Canada and Sweden, and a number of others have still smaller outputs. With no data available from Spain, Japan and the soviet union, no estimate can be given on 1940 world output.

The United States output of 516,400 long tons in 1939, a 7% decrease from 1938, was insufficient to meet the demand, and was supplemented by imports of 482,300 tons, almost entirely from Spain. Imports for the first ten months of 1940 fell to 285,500 tons.

British production of pyrite is insignificant (4,300 long tons in 1938); Australia, Southern Rhodesia and South Africa have outputs of 20,000–30,000 tons; there is no direct production in Canada, but by-product concentrates were recovered from copper ores and sulphur and sulphuric acid were produced from smelter gases, containing a total of 210,700 short tons of sulphur content in 1939, equivalent to about 421,000 tons of pyrite. (G. A. Ro.)

Quakers: *see* Friends, Religious Society of.

Quebec, one of the original provinces of the Dominion of Canada; area, 594,534 sq.mi.; population, according to the Dominion census of 1931, 2,874,255; estimated Jan. 1, 1941, 3,210,000. Capital, Quebec, 130,954. The only city with larger population is Montreal, 818,577. Of the province's population 1,813,606 are urban, or 63%; 2,696,122 native born; only 178,133 foreign born.

Two types of trade unions are found in Quebec; the national Catholic unions and the older international unions. The former

have a membership of about 71,833, while the membership of the latter is 43,656. The net value of production in the province for 1937 was $759,264,651, an increase of 15% over the preceding year. The gross value of agricultural products in 1937 was $110,218,770, of manufactures $445,885,666, an increase of nearly 6% over the preceding year.

The Union Nationale administration of the Hon. Maurice Duplessis was defeated in Oct. 1939 and the Liberals were returned to power with the Hon. A. Godbout as premier and attorney-general. The standing of the different parties (1940) was as follows: Liberal, 68; Union Nationale, 16; Independent, 1; and National 1. Sir Eugène Fiset was the lieutenant governor. Quebec is represented in the dominion parliament by 24 senators who are appointed for life and by 65 members of the house of commons who are elected for five years or less.

BIBLIOGRAPHY.—*Statistical Year Book; Annual Report of the Provincial Secretary and Treasurer.* (J. C. HE.)

Queensland. A state of the Australian commonwealth lying in the northeast and occupying 670,500 sq.mi.; pop. (est. Dec. 31, 1939) 1,015,927. Chief towns (pop. Dec. 31, 1939): Brisbane 326,000; Rockhampton 32,600; Townsville 31,450. Governor: Sir Leslie Orme Wilson, G.C.S.I., G.C.M.G., G.C.I.E., D.S.O.

History.—Forgan Smith who had been premier since 1932 continued in office throughout the year 1940. Two new acting ministers, J. O'Keefe (Cairns) and M. E. J. Walsh (Mirani), were elected to the Queensland ministry by the labour caucus in May.

The secondary industries of the state benefited by defence contracts, and full employment was being experienced in most industrial and manufacturing undertakings. The prosperity of the state was enhanced by improved wool receipts, the satisfactory outlook in the sugar industry and the favourable position of the dairying industry.

Direct overseas exports were 10% higher in 1939–40 than during the previous record year.

The production of sugar is worth more to Queensland than any other single industry. The production for 1939–40 at 891,000 tons created a new record, and the sugar cheque amounted to £14,000,000. The outlook for the 1940–41 crop was satisfactory, but owing to damage by cyclones in some areas, production was estimated to be about 80,000 tons less than for the previous season.

The percentage of unemployment at June 30, 1940 was 5·1%. It is computed that, even at a time of unlimited demand for labour, this unemployment percentage cannot fall below 3·5 because of the unavoidable intermittency of work in many of the important Queensland industries.

Work was commenced on the Inland Defence Road on which £200,000 was to be spent during the financial year.

Justice Macrossan succeeded Sir James Blair as chief justice of the supreme court, but died on June 21, five weeks after his appointment. He was succeeded by the senior puisne judge, Justice Webb.

Education.—In 1938: schools 1,951; scholars 194,246.

Banking and Finance.—Revenue (1939–40) £A20,756,000; (est. 1940–41) £A21,199,000; expenditure (1939–40) £A20,740,000; (est. 1940–41) £A21,193,000.

Communication.—In 1939: roads, motor 39,000 mi.; railways 6,567 mi. Motor vehicles licensed (June 30, 1939): 76,842 cars and taxis; 43,153 commercial; 8,168 cycles. Wireless receiving set licences 133,217. Telephones 82,226.

Agriculture, Manufactures, Mineral Production.—Production in 1938–39: sugar, cane 823,086 tons; wheat 8,583,736 bu.; maize 3,733,424 bu.; wool 185,000,000 lb.; gold (1939) 145,667 fine oz.; silver (1939) 3,600,000 oz.; coal 1,121,000 tons. Industry, manufacturing, 1938–39: factories 3,087; employees (average) 51,551; production, net value £A19,301,475.

(W. D. MA.)

Quicksilver: *see* MERCURY.

Quisling, Vidkun Abraham (1887–), Norwegian soldier who achieved notoriety in 1940 as an alleged traitor to his country during the nazi invasion and thus contributed his surname as a synonym to the English language for the word "betrayal." He was born July 18 at Fyresdal, Norway and was trained from his youth for a military career. After passing the Norwegian war college examination in 1911 he entered the army, received his commission as captain, and was promoted to major of field artillery in 1931. Concurrently he had pursued a diplomatic career, as military attaché at Leningrad (1918–19) and Helsingfors (1919–21). He was a close friend of the explorer, Fridtjof Nansen, with whom he was associated for a time. In May 1933, four months after Hitler became chancellor of Germany, Quisling formed the Fascist National party of Norway. Quisling assisted the nazi invasion of Norway on April 9 by using his authority as army officer to delay mobilization, surrender certain key positions, and urging his countrymen not to resist the German troops. On Sept. 25, 1940 Quisling was proclaimed by the German forces of occupation as the fuehrer of Norway whose task it was to "reconstruct" his country in conformance with nazi principles.

Rabies: *see* VETERINARY MEDICINE.

Racing and Races: *see* AIR RACES; AUTOMOBILE RACING; HORSE RACING; TRACK AND FIELD SPORTS.

Radio, Industrial Aspects of. The following developments of 1940 were significant in the United States:

1. There was another marked rise in radio revenue accompanied by a rise in profits (though at a slower rate).

2. Operating expenses jumped appreciably. Consequently, the industry undertook an out-and-out battle with the American Society of Composers, Authors and Publishers after the latter had demanded higher licence fees.

3. Frequency modulation and television claimed much attention financially (and from the government), although television's exact status was still somewhat nebulous in 1940.

4. The industry exhibited a renewed alertness to the desires of the public, the demands of national defence and co-operation among the North American neighbour nations.

Radio v. Government.—*The "Network Monopoly" Investigation.*—There is a clause in the Communications act of 1934 to the effect that the Federal Communications commission may make "special regulations applicable to radio stations engaged in chain broadcasting." This latent power has never been invoked. But in 1937 a rising sentiment in congress prompted the FCC to order a general investigation of the networks. In the ensuing hearings, the National Broadcasting company and the Columbia Broadcasting system pleaded that they had refrained from monopolistic conduct and that their contracts, etc., were equitable. But the Mutual Broadcasting system (younger than its colleagues) charged that NBC and CBS had acquired such an iron grip on affiliated stations that Mutual was sometimes hampered from rendering proper service.

On June 12, 1940, a year after the last of the probings, the FCC made public its report on the networks. With unprecedented severity, the government agency belaboured the chains on the following grounds:

a. For retaining two and one-half times as much money as they paid to independently controlled stations on their hookups.
b. For optioning from two and one-half to three times as much time from their affiliates as was necessary.
c. For barring stations from accepting the services of more than one major network.
d. For demanding that affiliated stations maintain a national rate which will not undersell the network rate.

The FCC accused the networks—specifically NBC and CBS—of laying their ownership open to unauthorized change via stock market transactions; of controlling large sectors of the talent business; of limiting service to profitable communities, and excluding the less profitable ones; of making inroads on the electrical transcription business, sometimes by implied unfair means; and of issuing contracts binding for longer periods than the actual licence term of a station. The report concluded:

"The heart of the abuses of chain broadcasting is the network-outlet contract. It is the committee's considered opinion that many of the existing inequities and arbitrary practices will find correction in the reformation of these contracts."

In answer to these charges, NBC and CBS made a flat denial, indicating that the "monopoly report" contained vital errors of fact as well as interpretation. The exclusive network contract, according to NBC and CBS, is the sole system of operation which guarantees adequate service to both public and advertisers. The Mutual Broadcasting system again dissented, and asked the FCC to issue regulations limiting a network's hold on its affiliates.

In order to clarify the situation, the FCC thereupon proposed seven rules and asked the networks to state their arguments against them. Such rules would:

(1) Limit or abolish exclusive network contracts; (2) decrease option time; (3) limit the length of contracts between networks and affiliates; (4) abolish the network's privilege of asking stations to maintain certain rates; (5) limit each network to one affiliated station per city; (6) limit network ownership of stations; and (7) guarantee stations the right to reject network programs "for reasonable cause."

No final decision on the whole affair was reached, but action of some kind was anticipated for 1941. The "monopoly report" and its resultant uproar stirred the interest of congress to greater heights, and there was talk of special legislation directly from this body.

Television and Frequency Modulation.—The progress of these new arts is discussed elsewhere in this volume (*see* RADIO, SCIENTIFIC DEVELOPMENTS OF; TELEVISION). The Federal Communications commission in 1939 recommended that television be given the "green light," meaning that partial commercialization was to be permitted. A few days after the final commission order was made public in Feb. 1940, the Radio Corporation of America announced a threefold television program to publicize the new art heavily. This program fell into disfavour with the FCC which immediately rescinded its permission for television commercialization, and said:

"The possibility of one manufacturer gaining an unfair advantage over competitors may cause them to abandon the further research and experimentation which is in the public interest and may result in crowding them into the market with apparatus at present efficiency levels."

In a series of new television rules promulgated since that time, the FCC stipulated that no one person may own or control more than three television stations, nor may any two of these be in the same service area.

With respect to frequency modulation, the commission placed similar restrictions on ownership. No person may own or control more than six stations, and here again; no two may be located in the same service area.

Changes in FCC Personnel.—On Oct. 14, Thad H. Brown, who had been a member of the Federal Communications commission (and its predecessor, the Federal Radio commission) since 1932 withdrew his name as a re-appointee. President Roosevelt had designated him for a new term of seven years, but in the midst of senate hearings on the matter he asked that his name be withdrawn. His withdrawal left the FCC in 1940 with only a six-man board, no one having been named to fill the vacant place.

Programming.—*Network Commercial Programs.*—About half of radio's gross revenue is derived from network commercial programs. The 15 most popular network commercial programs as of Dec. 1[1] were:

1940	*1939*
1. Jack Benny	1. Chase & Sanborn Program (Edgar Bergen, etc.)
2. Chase & Sanborn Program (Edgar Bergen, etc.)	2. Jack Benny
3. Fibber McGee & Molly	3. Lux Radio Theatre
4. Lux Radio Theatre	4. Kraft Music Hall (Bing Crosby)
5. Bob Hope	5. Fibber McGee & Molly
6. Kate Smith Hour	6. Major Bowes
7. Major Bowes	7. Bob Hope
8. Kay Kyser	8. Kate Smith Hour
9. Aldrich Family	9. Fitch Bandwagon
10. One Man's Family	10. Kay Kyser
11. Fitch Bandwagon (guest orchestras)	11. Good News (Edward Arnold, Fanny Brice)
12. Fred Allen	12. One Man's Family
13. Walter Winchell	13. Fred Allen
14. Kraft Music Hall (Bing Crosby)	14. Burns & Allen
15. Eddie Cantor	15. Pot o' Gold

Since 1939 the tendency toward shorter, less formal programs has continued. Whereas in 1939 eight 60-minute programs qualified for the leading 15, in 1940 the number decreased to five. Drama continued to be represented even more strongly. And a war-inspired appetite for news and comment boosted Walter Winchell into 13th ranking position, whereas in 1939 no commentator or newscaster qualified at all.[2] Major Bowes and Kay Kyser (in seventh and eighth positions respectively) once more underscored the fact that the audience-participation type of program is still very popular.

Network Evening Programs.—In order that the network evening picture (commercials only) may be clear, programs are compared by categories. This tabulation covers June-December for both 1940 and 1939[3]:

Type of program	*1940 Pct. of Total*	*1939 Pct. of Total*
1. Variety	24%	36%
2. Drama	19%	18%
3. Tests, contests, quizzes, etc.*	18%	16%
4. Popular music	13%	8%
5. News and news comment	10%	6%
6. Familiar music	7%	3%
7. Classical music	3%	3%
8. Comedy teams (Amos 'n' Andy, etc.)	2%	3%
9. Religion	1%	1%
10. Semi-classical music	1%	3%
11. Sports	1%	1%
12. Talks, gossip, instruction	1%	1%

*Also referred to as "audience-participation" programs.

The decline in variety programs in 1940—the big, expensive offerings composed of music, drama, novelty, etc.—was striking. Most of these programs are founded on "name star" values, principally headliners of the Jack Benny, Fred Allen, Bob Hope calibre. They are thus extremely costly, and are furthermore limited somewhat by the available supply of "star" talent. In view of such factors, advertisers in 1940 did not consider variety programs "outstanding buys," and therefore started a trend toward cheaper, less formal shows. Furthermore, in radio entertainment—as in all other forms of entertainment—conspicuous success immediately invites competition. Hence successful programs of the quiz type, which are usually cheap and draw a good audience, have pried the variety programs loose from their erstwhile stronghold. This is not to say that in future years the variety show will be outmoded. Headliners will always be in demand among those advertisers who have large appropriations for programming. But otherwise variety was in 1940 commanding much less attention than formerly.

[1] These ratings are supplied through the courtesy of A. W. Lehman, manager of the Cooperative Analysis of Broadcasting, and are copyrighted by the latter. The CAB is the industry's major fact-finding body in the field of programming.
[2] Lowell Thomas ranked among the first 15 programs at various times during 1940.
[3] Compiled especially for the *Britannica Book of the Year* by the *Variety Radio Directory*. This system of calculation automatically weights the bigger programs for their increased availability to listeners.

Drama meantime forged ahead. Radio's technical capacity has vastly increased during the past several years, as has the supply of good writers, and this combination of circumstances is to drama's advantage. Drama has the additional quality of varying widely in content, enabling an appeal among all levels of the listening audience, and usually at a cost which is not excessive. Drama therefore should continue to command more and more attention in the future.

Quiz, contest and audience-participation programs in 1940 remained at a high level. Thirty-three such programs appeared on the major networks in 1940. An analysis of their appeal must take into consideration:

(1) That games have always been popular in the American home; (2) that self-education is deemed important by some sectors of the audience; and (3) that the near-lottery appeal of a number of the programs is a further inducement to listen.

The position of news and news commentators is self-evident in view of the war and the presidential campaign. As a concrete example of the widespread interest in news, the Cooperative Analysis of Broadcasting reported that "between Aug. 24–29, 1939, news broadcasts covering the war crisis accounted for 18·7% of all daytime program mentions, and 27·2% of all evening program mentions. . . ."

Network Daytime Programs.—Again in 1940, serial dramas (akin to the comic strips in newspapers) and dramatic offerings of other types continued to occupy the vast majority of network commercial time. The apparent 7% decrease noted in the table below is really a mathematical quirk resulting from the interjection of "opera" as a new commercial category this year. Over 70 different dramatic series appeared on the networks in 1940. The following tabulation is the daytime equivalent to the evening table cited above:

Type of program	*1940 Pct. of Total*	*1939 Pct. of Total*
1. Serials and drama	78%	85%
2. Opera	9%	...
3. Talks and instruction	6%	5%
4. News and news comment	1%	4%
5. Variety	1%	2%
6. Religion	1%	1%
7. Single acts (one-person variety entertainment)	1%	1%
8. Semi-classical music	1%	...
9. Hymns	LT	1%
10. Audience participation, tests, etc.	LT	LT
11. Familiar music	LT	LT
12. Popular music	LT	2%
13. Novelty	LT	LT

(LT signifies less than one-half of 1%.)

Talent Costs.—Based on data compiled by *Variety,* the aggregate talent costs of network commercial programs during 1940 amounted to $35,000,000, of which $30,000,000 was consumed on evening programs and $5,000,000 on daytime programs.

Increased Listening.—Listeners devoted more attention to radio in 1940 than ever before. Cooperative Analysis of Broadcasting reports indicate that during the first portion of the year, listening to network evening commercial programs was 37% higher than in 1939. During the summer, evening listening stood 25% above the prior year, while daytime listening had advanced 11%. It seems apparent that radio's barrage of war and presidential news played a conspicuous role in the acquisition of more listener-attention.

Educational and Public-Information Programs.—There was in 1940 a decided improvement in the quality of programs falling into this category. The industry's whole-hearted co-operation with the government in the national defence program was an outstanding example of public service. At no time has radio spared expenses in advancing public education or information. CBS, for instance, reputedly allotted $30,000 per month toward war coverage in the summer of 1940. And the U.S. office of education estimated that since 1936, U.S. stations donated nearly $1,000,000 annually in free time for education purposes.

Local Station Programming.—Non-network programming showed very few changes. Bigger stations attempted to schedule a balanced, "all around" radio diet, while the smaller outlets found their greatest programming sources in music, news and sports.

Quiz and Contest Programs.—On March 29 the Federal Communications commission announced that in its estimation five contest programs violated that section of the Communications act which prohibits lotteries. The FCC therefore referred the matter to the department of justice for a ruling. Here the crusade came to naught, however, for the attorney-general's office held that "prosecution . . . should not be instituted." The five programs were of the cash "give-away" type, awarding listeners monetary considerations either on the basis of skill in some game, or by outright chance. All of them successfully escaped the legal definition of lottery. Craig Earl (known on the radio as "Professor Quiz") estimated that between 400 and 500 U.S. stations were carrying programs of the quiz kind.

New Name Stars.—Practically all the great and near-great "names" of the world have at some time or another appeared on the radio. Two exceptions were the Lunts and Katharine Cornell. In 1940 both made their debuts under the auspices of the Red Cross.

Radio Set Ownership.—U.S. set ownership, as of Jan. 1, 1941, as compiled by Orestes Caldwell, editor of *Radio Today,* is as follows:

Total sets in use	50,197,000
Auto radios	8,000,000
Battery portables	1,800,000

Revenue and Finance.—*Revenue 1940.*—Preliminary revenue estimates for 1940 (which will not be verified until the summer of 1941 when the FCC computes official figures) assign the following intake to broadcasting:

	1940	*1939*
Network gross time sales	$96,000,000	$ 83,114,000
Total industry gross time sales	190,000,000(?)	167–170,000,000
Total industry net time sales	145,000,000(?)	129,470,000

"Gross" time sales represent the sale of time prior to any discounts whatsoever. The figure is computed solely for purposes of comparing radio intake with the intake of other advertising media. "Net" time sales are actual cash receipts.

The networks—which once more enjoyed a huge rise in revenue—found their best customers among the manufacturers of "quick turnover" items, principally the makers of grocery and drug lines, including foods, soaps, beverages, toilet goods, cigar products and confectionery products. Some 85% of all network revenue comes from these two major categories. Network radio has proved to be peculiarly effective in the advertising of such "quick turnover" lines for two main reasons: (1) network radio is a relatively cheap means of reaching a big audience; and (2) radio has the inherent ability to spread advertising stimuli at the right time, and as frequently as the advertiser desires.

Profit.—During 1939 (1940 figures were [Jan. 1, 1941] not available), a total of 478 broadcasting stations, representing 68% of the 705 operators, showed an excess of revenue over expenses. On the other hand, 227 stations, or 32%, showed a combined loss of $2,220,471. Addition of profit and loss indicates that all U.S. stations exceeded their expenses by $18,206,716 prior to federal taxes. The networks during this interval had a profit of $5,631,228, making the industry total $23,837,944. This showing was about $5,000,000 better than in 1938.

Expenses, on the other hand, skyrocketed by $7,500,000 to

Above: A "BEER MUG" radio relay station was used to broadcast floor proceedings of the two U.S. national political conventions in 1940

Above: INTRODUCTION OF FREQUENCY MODULATION broadcasting was an important radio milestone of 1940. On Aug. 1 Maj. Edwin H. Armstrong, inventor of "FM," flipped the key that launched W2XOR in New York city as the first full-time station for broadcasting static-free programs

Below: MAX JORDAN, U.S. radio war correspondent, broadcast an eyewitness account of the war in the spring of 1940 from a vantage point 500 metres from the German border

Below: MONITORING short-wave broadcasts from Europe in 1940

reach the unprecedented total of $100,043,920. In other words, the rise in the rate of profit slowed down, whereas the rate of expense increased.

Table I shows one further breakdown of 1939 revenue and serves to indicate still more clearly the incidence of expenses and profits by individual broadcast stations.

Table I.—*Expenses and Profits in 705 U.S. Radio Stations in 1939*

Revenue Group	No. of Stations	Total Expenses	Total Profits
$1,000,000 or over	6	$ 6,970,636	$ 3,489,487
500,000 to $1,000,000	32	15,587,673	6,811,174
250,000 to 500,000	63	15,584,085	5,090,028
225,000 to 250,000	14	2,382,903	839,923
200,000 to 225,000	8	1,293,310	372,504
175,000 to 200,000	16	2,381,697	500,685
150,000 to 175,000	15	2,168,011	175,606
125,000 to 150,000	27	3,101,968	506,450
100,000 to 125,000	35	3,501,508	211,548
75,000 to 100,000	59	4,736,528	214,956
50,000 to 75,000	87	5,107,012	277,757
25,000 to 50,000	157	6,958,864	98,474*
15,000 to 25,000	83	1,823,206	79,659*
1 to 15,000	103	1,086,529	105,269*
	705	$71,783,930	$18,206,716

*Indicates deficit or other reverse items.

Industry Assets.—The tangible property of the entire industry in 1939 had a depreciated value of $35,545,645. The original cost was $64,424,626.

Radio v. Other Advertising Media.—Again in 1940, radio's rate of advertising growth appeared to have exceeded that of the other major media. During 1939 radio's gross advertising revenue increased 12½% over 1938, whereas magazine revenue increased 2½% and newspaper revenue 1½%. The year 1939 also marked the first time that radio's total advertising revenue appreciably exceeded magazine revenue.

Employment-Unionism.—*Employment.*—Radio's boast that it pays higher wages than any other U.S. industry was again maintained in 1940. Employment figures applicable to the early part of the year are shown in Table II.

Table II.—*Employment Figures of the U.S. Radio Industry*

	1940	1939
Full-time employees	19,873	18,359
Average weekly compensation	$45 94	$45.20
Part-time employees	4,014	4,377
Average weekly compensation	$22.66	$23.55

(These figures were compiled by the Federal Communications Commission. They include all standard broadcast stations and the three major networks.)

There is, of course, quite a divergence in pay scales between the major networks and the individual stations. On the whole, however, the scales were high in both instances in 1940, as will be seen via the tabulation in Table III.

Table III.—*Average Pay Scales in the Radio Industry in the U.S.*

Employment Category	Average Wkly. Station Pay	Average Wkly. Network Pay
General managerial executives	$110	$382
Research-development employees	54	66
Operating (technical) employees	39	66
Program production employees	39	56
Writers	32	57
Announcers	33	66
Staff musicians	48	126
Commercial salesmen	48	121

The average pay for all executives on all individual stations was $80 weekly; on the networks it was $230. The average pay for all types of employees (other than executive) on individual stations was $37; on the networks it was $58.

Unions.—Organized labour by 1940 was an accepted fact in the radio industry. Unions gained their foothold almost entirely by means of negotiation. Strikes were so few as to be statistical oddities.

At the beginning of 1940 it was feared that there would be a major ruction between the broadcasters and the American Federation of Musicians (an A.F. of L. affiliate). The musicians' contract was due for renewal, and the union indicated that it wanted an annual guarantee at least $1,500,000 higher than the previous $3,000,000 guarantee. Networks and stations alike balked at this 50% increase. A strike seemed imminent when Assistant Attorney General Thurman Arnold[1] issued a statement denouncing "restraints designed to compel the hiring of useless and unnecessary labour." Following this dictum, the musicians dropped their formal proposals, and the broadcasters advanced no counter-proposals. Subsequently both factions proceeded as if the old contract were in force, although that paper expired.

Meantime, the actors-singers-announcers' union (American Federation of Radio Artists, also an A.F. of L. affiliate) was awarded a new network contract valid until 1943. The agreement—a dual affair—covers both sustaining and commercial programs. It provides for a pay increase of about 10% on sustaining programs, and continues the previous commercial rates without change. As in the case of the musicians' union, the broadcasters' relationship with AFRA was unmarred by strikes. When two major outbursts threatened in the course of the year, one was settled by arbitration, and the other succumbed to the pacifying influence of mediators.

Literary-Musical Property.—*Literary Property.*—It took the industry many years to acquire a technique whereby a book or play could be effectively re-created by aural means alone. And even when this point had been reached radio continued to be without a literature of its own and had to borrow freely from writings in other fields. In recent years, however, radio developed an intramural roster of serious writers and by 1940 their output exceeded by a considerable margin the borrowings from the classics. This trend is clearly illustrated in the figures shown in Table IV (covering network programs only).

Table IV.—*Source of U.S. Radio Material*

	1940	1939
Adaptations of stage plays	111	165
Adaptations of prose and poetry	89	60
Total adaptations	200	225
Serious materials especially written for radio	286	207

Musical Property.—There has never been a time in the history of broadcasting when the industry was not at sword's-point with the American Society of Composers, Authors and Publishers (ASCAP). The latter is a voluntary alliance of composers and music publishers for the purpose of licensing the performing rights to their pooled compositions. In the very earliest days of radio, ASCAP won an impressive series of court victories over the broadcasters, thereby establishing the right to collect licence fees from radio for the use of ASCAP music. These fees, however, were not geared to the amount of music used. Rather they took the form of a flat tax of 5% on a station's net business, a sum which in 1939 aggregated $4,142,000.[2] Another feature of the ASCAP contract has been that no fee is applied directly against the networks. That portion of network business paid over to the stations is taxable, but the portion retained by the networks themselves escapes fees.

Surmising that when the current ASCAP contract expired ASCAP would ask for higher fees plus a provision covering the networks, the broadcasters in 1938 launched a music society of

[1] *Cf.* Thurman Arnold's letter of Nov. 20, 1939 to the Central Labor union in Indianapolis. The letter referred to building trade unions, but was interpreted as also applying to the musicians' union.

[2] Stations controlled by newspapers have a separate contract calling for 5% payments only on those programs using ASCAP music.

their own called Broadcast Music, Inc. (BMI). Primarily designed as a lever to pry down ASCAP demands, BMI gradually developed from a mere threat into a music reservoir of sizable proportions.

In the summer of 1940 ASCAP issued a proposed new contract designed to become effective at the beginning of 1941. True to expectations, a network fee—amounting to 7½%—was included. Station fees remained the same in some instances, and were reduced in others. But on the whole, ASCAP's expectations of revenue were set considerably higher than before.

The majority of stations and all of the networks flatly turned the new ASCAP contract down. Which—in simplest terms—meant that there would be no ASCAP music on virtually all of radio after Jan. 1.

Open warfare toward the close of 1940 was being pursued by both sides, and the department of justice was inaugurating proceedings against ASCAP, BMI, NBC and CBS under the Sherman act. It was the department's contention that the music societies have engaged in illegal price-fixing, and that they were mutually boycotting each other in an attempt to gain monopoly of the field.

Phonograph Records.—In July 1939 the industry received a legal blow when a court decision held that (1) phonograph records may not be broadcast via radio if the manufacturer intends them for use in homes only; and (2) that the recording artist has a right to stop the broadcasting of phonograph records made by him, since this constitutes unfair competition to his personal appearances.

This decision seemed to pave the way for the licensing of records—a trend which would prove quite costly to the broadcasters. But in the interim all parties to the original suit were not satisfied. They carried the case to another court, and here the broadcasters in 1940 won a sweeping victory. Said the court:

"We think the 'common law property' in these (recorded) performances ended with the sale of the records and that the restriction (warning against use via radio) did not save it; and that if it did, the records could not be clogged with a servitude. . . .

"Copyright in any form . . . consists only in the power to prevent others from reproducing the copyrighted works. WBO Broadcasting Corp. (the defendant) has never invaded any such right of Whiteman (complaining artist); they have never copied his performance at all; they have merely used copies which he and the RCA Mfg. Co. made and distributed. . . ."

Research.—Traditionally radio has always been in the forefront of research as regards markets and media. Because radio "coverage" cannot be counted like newspaper or magazine circulation, the broadcast industry has perforce had to avail itself of the tools offered by psychology and statistics.

In 1940 definite changes in radio research took place. Technically, there was a trend toward the use of smaller samples, but under circumstances of better choice and cultivation. In short, the keynote of 1940 was intensification, coupled with a tendency to pay more attention to research of the "qualitative" type.

One major topic of the year was the measurement of radio's efficacy as a sales medium. Numerous studies appeared, indicating what effect radio advertising had in influencing the purchase of this or that brand of goods.

Another type of probing consisted in measuring the psychological impact of programs and their advertising messages. The purpose of studies such as this is to determine the listener's continued—but varied—reaction to the component parts of a program, and to correct those portions not favourably received. A great aid in research of this type is the recent Lazarsfeld-Stanton program analyzer, an electrical device to record listener reaction.[1]

Radio in the Western Hemisphere.—Since the beginning of the war in Europe, the U.S. has politically and economically paid more and more attention to its neighbour nations in the western hemisphere. This attitude has likewise been reflected by the broadcasting industry which is seeking in every way possible to cement better relations on the two western continents.

North American Regional Broadcasting Agreement.—This treaty divides radio waves equitably among all the principal North American nations, and ends the wave-length chaos of former years. Mexico was the last of the nations to ratify the document (which was framed in 1937), but on March 29, 1940 the Mexican ambassador to Cuba formally deposited the ratification papers with that government. In the U.S., the treaty stipulations will take effect on March 29, 1941 when all but 95 of the 850-odd stations must shift their frequency (wave-length) to comply with the new international rules.

One of the major effects of the treaty will be the doom of the notorious Mexican border stations. Many of these were operated by U.S. capital which had been denied access to U.S. radio facilities. Operating with high wattage, the border stations not infrequently "pirated" wave-lengths otherwise assigned in the U.S., and blasted a signal across the midwest to advertise "health aids" and similar "medical" cures. It had long been rumoured that these powerful evaders were instrumental in delaying Mexico's ratification of the treaty so many years. Plans were afoot in 1940 to buy out unscrupulous U.S. interests with Mexican capital. At any rate, hopes were high that this border nuisance would be abated.

As regards the effect of the treaty within the borders of the U.S., there is much room for argument. True enough, interference from other nations is abolished. But under the treaty the U.S. is allowed a certain number of high-power stations which are to be interference-free from other U.S. stations at night. The FCC however, has shown an inclination to believe that the owners of these stations will get undue social and economic advantage over their competitors. The commission proposed a second full-time station on a channel which, under the North American agreement, specifically cannot have such a second station operating at night. How this FCC attitude will affect the execution of the treaty in years to come was not predictable in 1940.

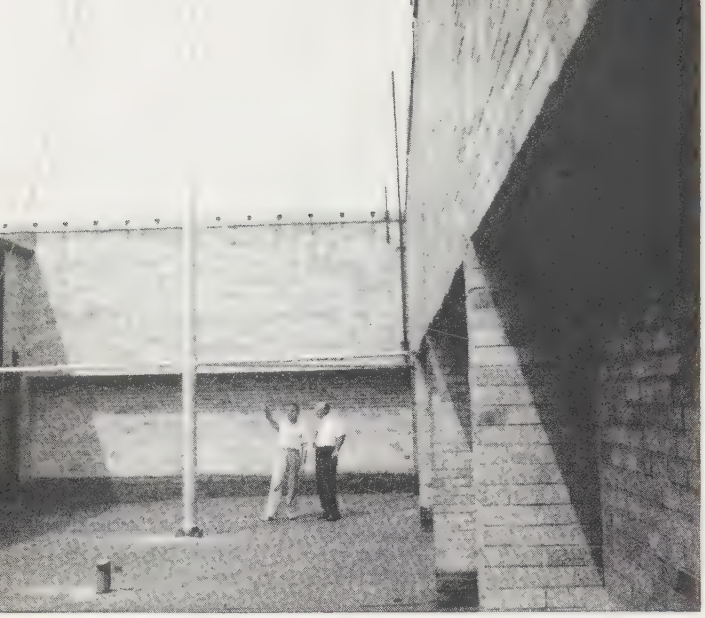
U.S. Latin-American Broadcasts.—The National Broadcasting company not only issues a steady stream of programs to Latin and South American nations via two high-powered short-wave stations in Bound Brook, N.J., but also sells time to sponsors who wish to reach the markets to the south of the U.S. Eleven such sponsors in 1940 used the NBC facilities. NBC estimates that of the 4,000,000 Latin-American radio sets, about 2,500,000 were equipped in 1940 to pick up its short-wave signals. Fan mail from this sector has been increasing appreciably, indicating an interest in the programs.[1]

During the year, network officials toured South America extensively, and on the occasion of Gen. Manuel Ávila Camacho's inauguration as president of Mexico, U.S. broadcasters "covered" the event with great fanfare. In the past, U.S. broadcasters have all too frequently been accused of sending out programs which fail to exhibit an understanding of the Latin-American taste or temperament. Corrections in such fatal errors undoubtedly will be made after a firsthand knowledge of the neighbour nations is obtained. It is also possible that in the future some arrangement will be worked out whereby U.S. broadcasters and Latin-American broadcasters will "trade" employees after the manner of "visiting professorships" in universities. This scheme would promote genuine mutual understanding and co-operation.

The Columbia Broadcasting system announced that it is forming

[1] Developed by Dr. Frank Stanton, research director of CBS and Dr. Paul Lazarsfeld, director of Columbia university's Office of Radio Research. The device has two buttons which the listener may alternately push to register "favourable" or "unfavourable" reactions to a radio program. A stylus records the reactions as a running line on graph paper.

[1] Additionally, NBC allows Latin-American stations to rebroadcast its programs without fee. This procedure enables acquisition of an audience among those set owners whose receivers cannot pick up short-wave signals.



COAXIAL TRANSMITTING ANTENNA of station WOR for frequency modulation broadcasting, begun in 1940 at New York city

a Latin-American network to begin operations in Sept. 1941. The hookup will include 39 long-wave and 25 short-wave stations in 18 of the 20 republics to the south. However, because of the difficulty of installing and maintaining telephone lines to "haul" the programs from point to point, short-wave signals will be used. Member stations on the network will pick up the short-wave impulses, and convert them into regular long-wave emissions. The network, CBS claims, is founded with goodwill principally in mind. For that reason, programs will be sent not only to the south, but received from the south for U.S. consumption. Sponsored shows will be accepted.

Canadian Radio.—In the fiscal year ending March 31, 1940, the Canadian Broadcasting corporation had a commercial revenue of $774,000 as against $642,000 in the prior year. Meantime the corporation received $2,907,000 in licence fees (on receiving sets), representing an increase of about $250,000 over 1939.

The year 1940 brought few new regulations governing the conduct of Canadian radio, the bulk of such regulations having been framed at the start of the war. One new rule, however, caused much debate prior to its passage. This regulation limits sponsorship of news broadcasts to one spot announcement prior to the newscast, and one following it. Broadcasting of radio contests was also banned on Sundays because it appears that such broadcasts would violate the Lord's Day act.

The official estimate of Canadian radio families for Jan. 1, 1940, was 1,677,000. This figure is undoubtedly a minimum, and actual radio ownership may be somewhat higher.

As regards programming, the official tabulation shown in Table V (prepared by the Canadian Broadcasting corporation to cover

Table V.—*Types of Program Current in Canadian Radio*

Type of program	Pct. Hrs. Oct. 1940	Pct. Hrs. Oct. 1939
Musical programs	52%	60%
News bulletins	19%	16%
Talks	13%	11%
Variety	5%	6%
Stocks, rural and farm broadcasts	7%	3%
Drama	3%	2%
Special events	1%	1%
Public service	LT	LT
Children's programs	LT	LT

(LT signifies less than one-half of 1%.)

its programs during the month of October) is illuminating. It clearly indicates that the CBC is "loosening up" its schedules—that is, there is less formality and more "current interest" and "human interest" material. This trend cannot be underestimated, for it indicates the increasing value and maturity of Canadian radio. (E. A. Gd.)

Great Britain.—Throughout 1940, the British Broadcasting corporation carried on an uninterrupted broadcast service. Outstanding developments were the introduction of a program for the forces and a large-scale expansion of the overseas services.

At July 31, 1940, there were 9,132,200 wireless licences current in the United Kingdom. A "listening barometer" based on daily enquiry among representative samples of listeners and showing daily the audience for each item now enables the BBC to gauge the amount and nature of listening to BBC programs. During the year record audiences listened to the broadcasts by the king and the prime minister.

During 1940 the BBC's primary aim was to further the country's war effort. News was given, to listeners at home and all over the world, with the utmost speed consistent with accuracy and with a fullness limited only by the requirements of national security. The government's policy was explained by ministers of the crown, and nearly every aspect of the country's effort must have been described by expert speakers during the course of the year. At the same time, the nation's need for entertainment and recreation was seen to be as insistent as ever it had been in days of safety. The BBC did its best, with music, plays, variety and light features of all kinds, to reflect and reinforce the people's mood of stubborn cheerfulness.

BBC news observers, often accompanied by mobile recording units, described the war in Finland, on the western front, in the middle east, at sea and on the home front. Outstanding among these were a running commentary by Charles Gardner on an air battle at Dover, air raid experiences by Robin Duff, the evacuation from Calais vividly described by Vice-Admiral Sir James Somerville, descriptions of the evacuation from Dunkirk, and talks by R.A.F. pilots of raids on enemy territory and of air battles over Britain.

The king broadcast twice to the peoples of the British commonwealth; the queen spoke on the anniversary of the Y.W.C.A. and again on June 14, speaking in French to the women of France. Princess Elizabeth made her debut at the microphone when she inaugurated a children's feature for North American transmission.

Special mention should be made of the dramatic two-minute broadcast on June 17 when Mr. Churchill announced to the world Britain's determination to carry on the struggle though France withdrew. Another important broadcast was the one given by the prime minister on Oct. 21, when he spoke in English and French to the people of France. General Smuts, prime minister of South Africa, broadcast from Cape Town on July 21. Speeches by President Roosevelt were also relayed to listeners in Great Britain.

Entertainment programs inevitably reflected war conditions, notably the more serious turn of events in the spring, when sporting commentaries were dropped. The war effort was put before listeners in dramatic form, outstanding among such programs being the dramatization of the exploits of the Polish and British submarines "Orzel" and "Salmon," also the reconstruction of raids over Germany and the defence of Britain in two programs entitled "Bombers Over Germany" and "Spitfires Over Britain." Music occupied a large proportion of program time. The BBC Symphony orchestra gave a number of public concerts, as did also the BBC Theatre orchestra.

School broadcasting, adapted to conditions arising from evacuation, continued throughout the year. Innovations were the introduction on July 1 of a ten-minute news commentary for children and on Sept. 13 of a weekly short religious service for schools.

Broadcast experimentally from January during the evenings only, the program for the forces in June was extended to include

transmissions between 6:15 A.M. and 8 A.M., as well as a 12-hour service from 11 A.M. Designed for listening at the front, the program was planned after comprehensive research among the forces. After the evacuation of the British expeditionary force from France and Belgium, the program was continued in order to meet the needs of men and women on active service at home.

By the autumn of 1940 the BBC in its overseas services was broadcasting in 30 languages as compared with 19 on Dec. 31, 1939. The BBC's aim was to provide frequent news bulletins and talks of vital topical interest with the widest possible area of reception, to carry to neutral countries the British and Allied case, and to gain listeners among the German and Italian peoples. As a result of Germany's conquest of Denmark and Norway, and later of Holland, Belgium and France, the BBC alone remained to keep free broadcasting alive in western Europe. Facilities were at once extended by the BBC to Allied governments in London, and services were expanded in co-operation with them. Queen Wilhelmina, King Haakon, President Beneš and General Sikorski were thus enabled to address their oppressed peoples. In the BBC French service on June 18, 1940 General de Gaulle appealed to all free Frenchmen to continue the struggle by the side of Britain. In addition to the European service, there was the world service, incorporating the former empire service, and also the service including Turkish, Arabic and Greek for the near east, Afrikaans, and the Latin-American programs. In May a series of talks was started for listeners in the U.S.A. From this a North American service, incorporating that previously provided for Canada, Newfoundland and the West Indies, was being developed and was proving acceptable to listeners across the Atlantic. (*See* also ADVERTISING.)

Radio, Scientific Developments of. The scope of radio and the applications of the instrumentalities that were first developed for use in radio communications continued to expand. So also did radio communication itself. The extensions of the year 1940 involved not merely increased uses of old techniques, but the adoption of new scientific developments in both new and existing services. Wartime requirements directly affected transoceanic radio, and, to a lesser extent, the operation of radio in North America.

In long-distance radio, the occupation in war of European nations resulted in the ending of some services and the modification of others. Yet the demand for rapid and dependable communication between the continents naturally increased. Requirements for improved traffic capacity and the probability that messages and pictures would have to be exchanged in still greater volume during 1941, put emphasis on the adoption of facsimile as a means for increasing the accuracy and the word-carrying capacity of the available channels. In addition to providing for transmission of text at speeds of several hundreds of words per minute, the combination of facsimile and of photo-radio with some of the newer devices for overcoming or mitigating the disturbing effects of fading and multipath transmission, made possible the transoceanic and transcontinental delivery of pictures and photographs with considerably improved quality and speed. While the obvious immediate gain from the availability of such new facilities was had in the handling of business and press messages and of news pictures, these everyday advantages might eventually be overshadowed by the military value of such high-speed radio services across the oceans.

Radio transmission over short distances, say from hundreds of yards to hundreds (rather than thousands) of miles, was marked by the improvements in ultra-high-frequency tubes and accessory apparatus, by the further adoption of frequency modulation as a means for minimizing interference, and by the development of special terminal equipment for particular uses. New wave-generating and control systems made it possible in 1940 to develop higher radio-frequency power levels at far higher frequencies than ever before, and thus to communicate by telegraph, telephone or facsimile over greater distances than were previously thought to be within the capacity of the exceedingly short "micro waves." In this way entirely new fields for civil, military and emergency radio services were opened. The use of such extremely high frequencies, measured in hundreds or even thousands of millions of vibrations per second, facilitated the application of frequency modulation to the communication systems, with consequent extension of service distance and reliability under severe interference conditions. During 1940 these new developments were adopted for certain police networks, and it was reported that they were even more extensively applied in the military field; civil applications would doubtless follow.

In radio broadcasting, aside from television, the most notable features appear to lie in the recognition of frequency modulation as a service and in the increasing development of short-wave international transmission for news, information and propaganda. In May 1940 the U.S. Federal Communications commission designated 40 new channels, in the range from 42 to 50 megacycles, for regular broadcasting using frequency modulation, and shortly thereafter issued regulations designed to establish this new supplemental broadcast service on a basis that would provide improved freedom from interference. Pursuant to these provisions, new broadcasting stations were under construction in many parts of the United States; four were in regular daily operation in New York city and a number of others were to be erected. The new system of broadcasting also aroused interest in Canada, and stations were announced for early construction in Montreal and Toronto. On the basis of the experimental operations and developments of 1940, it would seem probable that the new broadcast services will not only provide additional programs and services to broadcast listeners, but will tend to relieve the congestion that has degraded the existing standard broadcast services. In some quarters the view was expressed that frequency modulation broadcasting will, in the course of perhaps a decade, entirely supersede the standard methods; it seemed more likely that the two will progress together, each supplementing the other and each taking precedence in the portion of the field that it is best fitted to serve.

Turning to international short-wave broadcasting, one finds that its political importance was heightened by the war. Of all the nations which used the short waves to reach their citizens overseas and to impress their particular cultural and other developments upon all who would listen to their programs, perhaps the Latin-American republics were most prolific. Technically, however, the British and the Germans developed and maintained the most comprehensive overseas radio services. During 1940 the United States government established new and higher scientific standards for the international stations licensed within its borders, so that it seemed probable in 1940 the reception of programs originating in North America and heard in Europe and Latin America would be placed on a parity with the best in such long-distance broadcasting.

Three other scientific developments in radio should be mentioned. One is the new "camera size" or personal broadcast receiver which attained such great popularity during the year. This easily carried, self-contained, battery-operated device was made possible only by the development of a completely new line of miniature vacuum tubes of high efficiency; it is looked on as possibly the forerunner of similarly portable two-way radio telephones that may ultimately provide us with person-to-person communication by radio. A second is the improved facsimile recording apparatus that has been developed, and which has so greatly increased operating speeds that at least three times as much text or pictorial material can be transmitted in a given time; 48 sq.in. of "copy" are recorded in black, on white paper, every minute that one of these new machines is in operation. Finally, there is the "electron microscope," which has been adopted by a number of research centres to provide magnifications far greater than possible with the best optical instruments. This, of course, is not strictly a radio device but it is built upon radio developments and is an interesting example of how advances in one field can contribute substantially along a still wider scientific front. (*See* also ADVERTISING; AIRPORTS AND FLYING FIELDS; RADIO, INDUSTRIAL ASPECTS OF; TELEVISION.) (J. V. L. H.)

Radium. The bulk of the world's radium production centred in 1940 around the outputs of the Belgian Congo and Canada, and by agreement between the producers the market was divided in a 60:40 ratio. No data were available on production in either country, but from statements of the receipt of concentrates at the refinery, it is estimated that Canadian production was of the order of 55–65 grams annually, and on the basis of the market agreement it would be anticipated that the Congo output was about 100 grams. Ores produced in the United States in 1939 contained almost 8 grams, but as production is primarily for the vanadium content of the ore, it is not known how much of the radium was recovered. A still smaller output was made in Czecho-

slovakia, which is scheduled for expansion since the territory came under German control

The United States imports increased heavily, to 38·75 grams in 1938 and 70·49 grams in 1939, but dropped back to 28 grams in the first 10 months of 1940.

The war raging in Europe had extensive repercussions on the radium industry that reached far beyond the ordinary disturbances in transportation that affected all products involved in international trade. The refinery in Belgium, to which the Congo ore was shipped for treatment, fell into German hands with the occupation of Belgium, and this necessitated new arrangements for ore treatment, or the temporary satisfaction of the entire demand by Canadian supplies, supplemented to some extent by the minor sources.

A further problem had to be met in England, where, to avoid loss by bombing, and subsequent harm to those frequenting an area where appreciable amounts of radium might have been dissipated by an explosion, hospitals transferred their radium supplies to a remote cave or excavation, where the radium emanation was collected and sent back to the hospitals for treatments. (*See* also VANADIUM.) (G. A. Ro.)

Railroad Accidents: *see* DISASTERS.

Railroads. The railroad record of 1940 was influenced favourably by several factors. Earnings were greater than in any year since 1930 in gross and since 1936 in net. The quality of service was better than ever before. In technical efficiency new high records were established, with freedom from strikes or other serious labour controversy. Substantial progress was made in financial reorganization of properties in the hands of the courts. Not affecting the operating results of 1940, but of importance from the long-time viewpoint, the passage of the new Transportation act (Sept. 18) held out promise of a more equitable basis of competition with other forms of transportation.

On the unfavourable side it should be noted that the improvement in volume of rail traffic was due in large part to activities, more or less temporary, of the national defence program. The competition with other forms of transportation continued in greater intensity. The 1940 Transportation act might have but slight effect on competitive relationships with trucks, pipe lines, buses and aeroplanes, and even though it, for the first time, provided for comprehensive regulation of interstate transportation by vessels on the inland and coastal waterways, the extent of such control was not as great as the railroads had desired. The revival of the St. Lawrence river power and navigation project was a serious threat, both in potential diversion of rail traffic and in curtailing the movement of coal. And, finally, the reorganization of the weakest railroads, which became bankrupt during the first years of the depression or earlier, could not solve the financial problems of the substantial number which barely escaped bankruptcy and were still weak financially. About 30% of the total mileage failed to earn all fixed charges in 1940.

The condensed income account in Table I affords comparisons of 1940 with the prosperous pre-depression year of 1929, the lowest year of the depression (1932) and the year 1939; the figures for 1940 are partially estimated.

Table I.—*Operating Results, Class I Railroads, 1929, 1932, 1939 and 1940 (U. S.)*

(In millions)

	1929	1932	1939	1940	Per cent of 1929		
					1932	1939	1940
Operating revenues	$6,279	$3,127	$3,995	$4,275	50	64	68
Operating expenses	4,506	2,403	2,918	3,090	53	65	69
Taxes	397	275	356	405	69	90	102
Net ry. op. income	1,252	326	589	650	26	47	52
Net income after charges	897	139*	93	155	*	10	17

*Deficit.

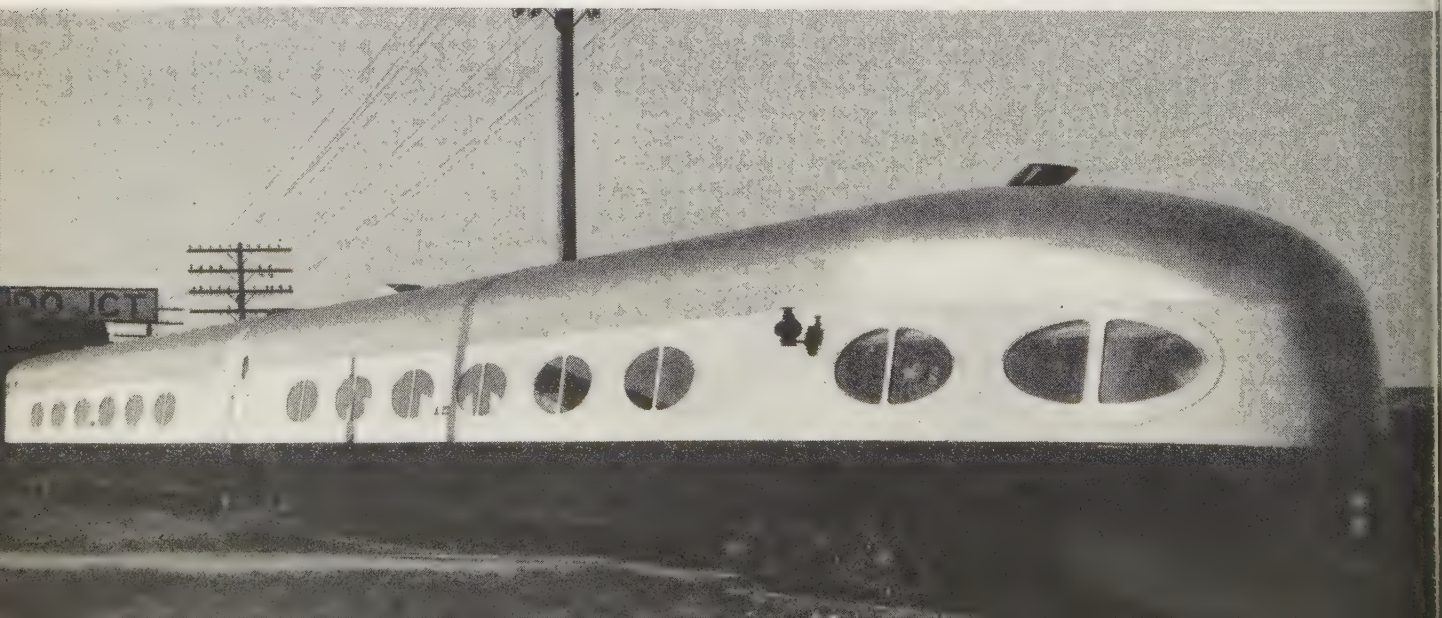
It is difficult to estimate how much of rail freight traffic in 1940 was attributable to the national defence program, but it doubtless had predominant influence. While that program continues the railroads will profit by the additional tonnage. Conversely, when that program is curtailed railroad earnings will be less.

It is not safe, therefore, to rely on immediately prospective earnings as evidence of permanently renewed railroad vitality. The earnings of transportation companies, collectively, rise and fall in degree corresponding closely with the fluctuating intensity of industrial activity.

In improvement in speed of passenger trains, and convenience and comfort of equipment and facilities, notable progress was made. During 1940 27 new high-speed passenger trains with modern streamlined equipment were added and 17 additional trains of that kind were under construction. Freight service likewise was expanded and quickened. One day or more was taken off the transit time of freight service by rail between many important cities.

Competition had effect also upon passenger fares and freight rates. The reduction of the rate in railroad coaches from 2½ cents to 2 cents per mile was ordered by the ICC in March,

A "JOUNCELESS" RAILROAD CAR resting on high springs above a low centre of gravity was exhibited in 1940



overruling the railroad desire to maintain the higher rate. With respect to freight rate reductions, however, the initiative was taken by the railroads and the commission's activities were mainly to restrain the railroads from going too low. The average revenue per passenger-mile in 1940 was about 1·75 cents, in comparison with 1·84 cents in 1939 and 2·81 cents in 1929. The average revenue per ton-mile in 1940 was about 0·95 cents, in comparison with 0·973 cents in 1939 and 1·076 cents in 1929. It should be noted, however, that the diversion of the higher rated commodities from rails to trucks tended to reduce the rail average because the lower rated commodities became a larger part of the total.

In technical efficiency the railroads set new high records. Table II indicates the degree of improvement in a few units.

Table II.—*Technical Efficiency of U. S. Railroads*

Item	First 10 months of		Year 1929
	1940	1939	
Ton miles per serviceable freight car day	657	601	582
Revenue tons per freight train	850	809	804
Freight train speed (m.p.h.)	16.7	16.7	13.2
Gross ton miles per freight train hour	33,856	32,704	24,539
Coal burned per 1,000 gross ton miles (lb.)	111	112	125

In 1940 a large part of the deferred maintenance of locomotives and cars was made up and many new freight cars were purchased or were on order. The assurance of the railroad executive officers that the railroad plant and equipment were adequate to take care of the extra transportation demands of national defence appeared to be reasonably sound.

At the beginning of 1940 there were 77,013 mi. of railroads in the hands of the courts for financial reorganization. At the end of the year the mileage was 72,907. Three Class I properties were transferred from receivers or trustees to the owners of the reorganized companies and several other Class I properties have reached the final stages of reorganization. It appeared that the effects upon the reorganized properties would be drastic reduction in bonds on which interest must be paid, the conversion of part of former fixed interest bonds into income bonds on which interest would be paid only when earned, the conversion of junior issues of mortgage bonds into income bonds and preferred stock, the total or partial elimination of former stockholders and the issuance of new stock to the creditors. It seemed that total interest charges, fixed and contingent, would be reduced about 50%.

The passage of the Transportation act of 1940 culminated efforts, extending over several years, to amend the Transportation acts of 1920 and 1933 and to recognize changed conditions. The more important features of the new law are:

(1) The declaration, for the first time, of a national transportation policy of fair and impartial regulation of all forms of transportation so administered as to preserve the inherent advantages of each; promote safe, economic and efficient service; foster sound economic conditions in transportation and among the several carriers; prevent unfair and destructive competition; and encourage fair wages and working conditions; (2) the transfer of the regulatory powers over water transportation from the Maritime commission to the Interstate Commerce commission and the expansion of those powers so that the regulation of interstate water carriers will be nearly as comprehensive as that of railroads and motor carriers; and (3) the creation of a new Transportation board, with limited life, to investigate and report to congress on the relative economy and fitness of carriers of all types; to determine the service for which each type is especially fitted or unfitted; to suggest the methods by which each type can and should be developed; to determine the extent of subsidy or other public aid; and to consider the fairness and adequacy of taxes.

In addition to the three new features above mentioned, the new law amended many sections of the old law so as to bring about approximate uniformity in the regulatory burden on each form of transportation except air. The new law did not apply to air carriers. (W. J. C.)

Europe.—Existing abnormal conditions in 1940 in Europe and adjoining continents make it desirable to treat railway activities in wartime separately from normal railway progress outlined hereunder.

Great Britain.—Normal renewals and developments on the British railways had to be severely curtailed after early summer and work was stopped on the extensions of the London tube railways to northeast and northwest London, owing to the difficulty of obtaining materials and to the necessity of diverting labour to more essential war work. This program was due for completion about 1941, as was the electrification of the London and North Eastern main line between Sheffield and Manchester, and the same railway's suburban electric service to Sheffield was also temporarily suspended. The London Midland and Scottish railway placed in service on its Liverpool-Southport electric line some new multiple-unit type cars, providing in three cars 268 seats on only 89 tons. First class travel was abolished on nearly all the electric trains of the London Passenger Transport board in February; new cars of a unique design started work on the Southern railway's Waterloo and City tube. London Transport's electric trains were extended over the London and North Eastern railway line to High Barnet in April, marking a further step in the £40,000,000 improvement program of 1935. The Central London tube had been completely modernized, a very intricate engineering feat as the line was kept open. The Great Western railway's success with 18 diesel railcars, which had run over 3,000,000 mi., resulted in a further 20 of an improved design being ordered for completion in 1940. Easter rail travel, in spite of the war, was stated to be a record one. The equipment of many stations with loud speakers for directing passengers proved extremely useful under the existing difficulties, and after many tests a satisfactory system of lighting was devised which permits of reading without infringing the "black-out" regulations: fluorescent lighting was tried with success for the train indicator at Paddington, Great Western railway. Under war conditions some of the express passenger trains have carried enormous loads; on April 3, the "Flying Scotsman" consisted of 22 coaches, weighing 703 tons; on the London Midland and Scottish railway, trials with electrically heated snow melters for points were successful.

France.—The French National railways had placed orders for 31,000 wagons to be delivered in 1940, and a further 20,000 in 1941, but the effect of France's surrender was not in 1940 known. Conversion of the Brive-Montauban and Paris-Dijon main lines to electric traction has been authorized when finances permit.

Germany.—In Germany a four-year program of rolling stock construction was undertaken, but most of the activities of the railway related to the land campaigns of the army. During the winter 1939–40 a series of 12 accidents took place in which 442 lives were lost.

Other European Countries.—The Italian State railways placed in service between Rome and Calabria a new six-car train constructed almost entirely of aluminium, thus greatly reducing the weight per car; conversion to electric traction continues. Albania was to have a railway, running from Durazzo to Labinoti via Elbasan.

In Switzerland the last remaining single line section of the famous Gotthard, between Fluelen and Brunnen, was being widened, but the work was of considerable magnitude. The Swedish State railways were energetically pressing forward their electrification program, including the Laangsele-Boden 312-mi. section of the East Coast railway. When completed electric traction will be continuous between Stockholm and the Lapland ore railway from Lulea to Narvik, on which electric traction was inaugurated in July 1914. The year 1940 saw the completion of a vital rail link in Vaestergoetland between Ulricehamn and Joenkoeping. In the Great Belt and Baltic services were badly interrupted by ice floes in the early spring. Progress, in spite of the war, has been made with the extension of the Norrland railway which has been opened as far as Mosjoen. The Portuguese National railway imported some of the famous Budd type stainless steel lightweight coaches from Philadelphia during 1940. Lithuania, which was making rapid progress with the reconstruction of its railway system after taking over Vilna, was later forced to hand over the control of its railways to the U.S.S.R. Many new lines have been completed in the European territory of the U.S.S.R., a typical example being that from Chelyabinsk in the Urals to Sinarskaya, 93 mi., thus linking industries around Orsk with Western Kazakhstan. New lines have also been constructed joining the Murmansk railway to the Finnish railways.

Asia.—On July 17, 1940 the first passenger train left Baghdad to traverse the final link of the so-called Baghdad railway between Mosul and Baiji; the train was to continue to Haidar Pacha and thus was achieved a scheme first conceived in the 1850s prior to the incorporation of the Suez Canal company in 1856. The through route traverses Iraq, Syria and Turkey, and, being built to standard gauge—4 ft. 8½ in.—would enable through trains to be run from London, Paris, Berlin and Rome to Baghdad, if a tunnel or train ferry is later provided as a means of crossing the Bosphorus. Construction work proceeded apace on the Iranian government's new standard gauge line between Teheran and Tabriz, the 90-mi. section from Teheran to Kazvin having been opened in March 1940. This line will be linked with the Russian and Turkish railways. In India the progressive Nizam's state railway placed in service some diesel railcars equipped with air-conditioning. Several new types of locomotives have been placed in service, some of which have been built in India. The Great Indian Peninsula railway now uses a track recording car and welded 210-ft. rails are being laid. In Malaya considerable progress is recorded in the correlation of rail and road services. Railway construction continued rapidly in the east, both in the U.S.S.R. and in Japanese-controlled China, Manchoukuo and Chosen. A typical example was the completion of the Tailing-Tangyuan line of 83½ miles on May 1.

Other Continents.—*Canada.*—Great increases of traffic and industrial production have vastly improved the finances of the two Canadian railway systems; on the Canadian National railways the net revenue for the first eight months rose by $24,000,000. Both railways have ordered many additional locomotives and other rolling stock, including novel designs of refrigerators.

South America.—There were few major developments on South American railways; it is not possible to record any improvement in the financial position. Diesel railcars and air-conditioning were two forms of progress which proved popular and were being extended.

Africa.—The South African railways were carrying out various deviation schemes, as in the East London area, thereby reducing heavy gradients on main lines and easing curvature. A large rolling stock three-year program, including 500 coaches and 8,000 wagons, was started. In Nigeria the appointment of director of transport was abolished, originally conceived to achieve co-ordination of transport facilities. New Garratt type loco-

motives have been introduced on the Rhodesian railways; in Nyasaland a line was being built in 1940 between Tete and Baue.

Australasia.—Railway construction continued slowly in Australia and New Zealand; for example, in the Sydney area and at Maryvale in New South Wales. At Sydney certain extensions to the suburban electrified network were completed. In New Zealand the railways earned a record revenue in 1939–40 and many additional express locomotives were acquired.

Railways in Wartime.—Communications were playing a part unparalleled in any previous war. Rail transport has been one of the main keys to all offensive actions. German successes have been due in large part to ability to paralyze by air interference enemy lines of communication and, consequently, railway centres and the harbours and docks which feed them have been subjected to grievous bombing. Rotterdam was one of the first instances in 1940, closely followed by Antwerp, Rouen, Le Havre, Nantes and Brest. Railway communications have suffered in Germany, notably such nerve centres as Hamm, Cologne, Mannheim, Berlin, Hamburg and Bremen. In the belligerent countries railway activities have been mainly concentrated on the war effort.

Great Britain.—Evacuation of children from the larger cities had taken place on a large scale in 1939 and the first unexpected load of magnitude to be faced in 1940 by the four British railways accrued in respect of the movement of the British army from Dunkirk to England early in June, in which many railway-owned steamers played a notable part. Without any notice 620 special trains carrying 300,000 passengers distributed these men throughout Great Britain from the ports between May 27 and June 4. The evacuation of 110,000 London children between June 13 and 18 required 180 steam trains, 180 electric and tube trains, 1,300 buses and 200 trams and trolleybuses. Great Britain itself becoming a war zone imposed many additional tasks on the railways in connection with the building up of an immense army, the protection of all vulnerable points, such as bridges and signal cabins, the diversion of some additional traffic from coastwise services to the railways and further large evacuation schemes, more particularly after indiscriminate bombing of London and other large cities started. The necessity of having large coal stocks near consuming centres, together with diversion of coal traffic from normal routes, owing to changing overseas and home markets, imposed a further heavy task. In one week 255,000 coal wagons were moved by rail and 2,200 extra coal trains ran between February and June. To some extent passenger services were reduced, but the real period of trial came with the intense air bombardment by day and night during September. Few sections of line were out of service for more than a few days at most and London benefited by its multiplicity of alternative routes and enormously by the full co-ordination of its railway, bus and trolley services, achieved through the pool arranged some years ago between the mainline railways and the London Passenger Transport board. The replacement of railway services by buses at a few minutes' notice proved the enormous value of rail and road co-ordination.

France, Belgium, Holland, Norway, Denmark and Poland.—Railway working in these territories occupied by Germany has been carried on, where it was physically possible, under the direction of German railway officials; civil traffic formed a very small proportion of train mileage; despatch of captured foodstuffs, livestock, materials and armaments to Germany was given priority over all but military traffic. Restrictions on passenger travel were very rigid; lack of oil products forced the withdrawal of railcars and diverted road traffic to the railways. The German authorities have proved extremely efficient in repairing damaged bridges and other essential railway facilities, adequate training and preparations for the work having long been in hand. Thus, in Holland replacements of damaged bridges arrived shortly behind the first wave of troops, as had occurred in Poland.

Germany.—The events of 1940 have borne witness to the remarkable efficiency of the German railway system, a point long recognized by all technical experts. Originally constructed with strategic aims in view, the nazi regime has developed the system along two main principles—social service and war needs, irrespective of financial results and lack of return on capital. The railway systems of Sudetenland, Bohemia-Moravia, German-occupied Poland and Alsace-Lorraine were (1940) operated as sections of the German railway, and the services closely interlocked with those of occupied territories stretching to Irun, on the Spanish frontier, Brest and the channel ports in the west and Bratislava (Slovakia) and Przemysl in the east. Hard pressed by unparalleled cold weather in the spring, which closed navigation on the Danube and other waterways of central Europe for long periods, the strain on German rolling stock, especially wagons, proved crucial, but the position was relieved by the acquisition of rolling stock from occupied territories, particularly France. Nevertheless, increased hauls for traffic within and across Germany, such as the despatch of 1,000,000 tons of coal a month by rail to Italy, imposed a serious strain on Germany's railway system, and, with its delicate working upset to some extent by war damage, it remained one of the keys to the entire war situation.

Italy and the Balkans.—Italy's entry into the war imposed on the Italian state railways a load for which they had long prepared, but which they remained comparatively ill-equipped to carry. Electrification has served to ease the problem of coal supplies, but electric traction was itself highly vulnerable to interference, being dependent on centralized sources of power. Comparative shortage of oil and gasoline enforced reduction of railcar services, extensively developed in Italy, but coastwise services have been used to distribute coal and relieve the railways' burden. While Greece, Yugoslavia, Hungary, Bulgaria and Rumania had retained their neutrality up to Oct. 1940, considerable pressure had been brought to bear upon them to act as feeder services to the Italian and German railway systems. Oil traffic from Rumania and from the U.S.S.R. via Bulgaria passed in large quantities to Germany and later to Italy, supplementing the water route up the Danube to Bratislava, Vienna and Regensburg. Tobacco from Greece, ore from Yugoslavia and grain from Rumania, which had previously gone by sea, have had to be routed by rail across Europe.

U.S.S.R.—Even excluding the occupation of eastern Poland and the Finnish war, the Russian railway system has been materially affected by hostilities in western Europe. Its trans-Siberian route has had to carry an unprecedented volume of traffic and has suffered from congestion at Vladivostok and Manchouli, the frontier with Manchoukuo. Oil and other traffic from the Baku region has created considerable congestion at Batum, whence much is shipped to western Black sea ports. After taking over northern Bukovina and Bessarabia from Rumania, the standard gauge was converted to the Russian five-foot gauge, a policy which had applied also in occupied Polish territories and which was completed by the middle of 1940. The railway systems of Estonia, Latvia and Lithuania became a part of the U.S.S.R. network after the absorption of these countries in 1940. (*See* also BANKRUPTCY; DISASTERS: *Railroads;* UNITED STATES: *Transportation.*) (C. E. R. S.)

Rainfall: *see* METEOROLOGY; FLOODS AND CONTROL.
Raisins: *see* GRAPES.

Ralston, James Layton (1881–), Canadian statesman and member of the war cabinet. He was born Sept. 27 at Amherst, N.S., was graduated from Dalhousie law school and was called to the bar in 1903, after which he practised law in Nova Scotia. In 1916 he went to France as a major of the 85th Canadian infantry battalion, which he commanded from April 1918 until its demobilization in June 1919. He was awarded the Distinguished Service order with bar, made a Companion of St. Michael and St. George, and was mentioned twice in dispatches. In 1924 he was gazetted colonel. He accepted the portfolio of minister of national defence in the federal cabinet in Oct. 1926 and was elected to the house of commons by acclamation the next month. In 1930 he was a delegate to the London naval conference and was again elected member of parliament from Nova Scotia in the elections of that year. With the defeat of the Liberal party in Aug. 1930 he resigned and resumed the practice of law at Montreal. On Sept. 6, 1939, he was appointed minister of finance in the King cabinet, and on Jan. 2, 1940, he was elected by acclamation to the house of commons as a Liberal member for Prince Edward island. After presenting the second war budget June 24, 1940, he took over the portfolio of minister of defence, left vacant by the death of Norman McLeod Rogers (*q.v.*).

Rapid Transit: *see* ELECTRIC TRANSPORTATION.
Rates of Exchange: *see* EXCHANGE CONTROL AND EXCHANGE RATES.

Rautenburg, Robert (1857–1940), German-American sculptor, was born in Silesia, Germany. He studied wood and stone carving in Berlin, Paris, Vienna and Rome. He assisted in excavations at Pompeii and Herculaneum and restored many broken statues. He later specialized in ecclesiastical sculpture, doing work for churches in Vienna, Berlin and Paris. He went to the United States in 1887 and worked with Saint-Gaudens and Grafly. He did the statuary work for the main staircase of the Congressional Library in Washington and for several U.S. churches. He died in Arden, Del., Feb. 21.

Rayburn, Sam (1882–), U.S. legislator, was born Jan. 6 near Kingston, Tenn., and was graduated with a bachelor's degree from East Texas college. He studied law at the University of Texas, then began practice at Bonham, Tex. After four years as a member of the Texas house of representatives and two years as speaker of the house he was elected to the U.S. congress, of which he has been a member since 1913. A close friend of President Roosevelt, he was elected Democratic majority leader of the house in 1937 and in this office was responsible for the steering of much New Deal legislation to successful completion. On Sept. 16, 1940, Rayburn was elected by acclamation to succeed the late William B. Bankhead (*q.v.*) as speaker. He was succeeded as majority leader by Representative John W. McCormack of Massachusetts.

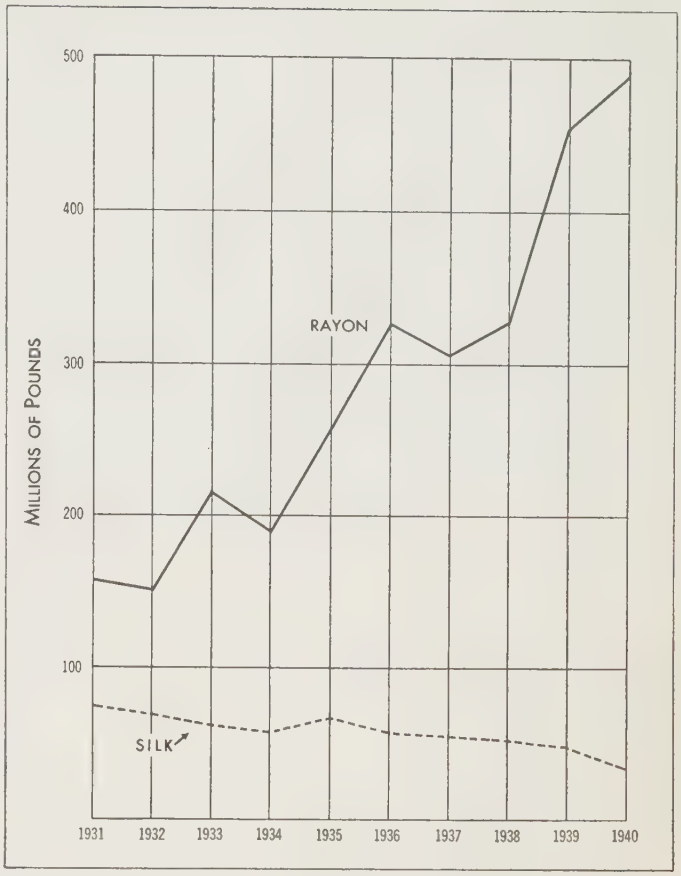
Rayon. World rayon production again showed an increase in 1940 over all previous years, chiefly in production of rayon staple fibre. In 1940, of the total 2,500,000,000 lb. produced, 1,350,000,000 lb. were staple fibre and 1,150,000,000 lb. filament yarn. (The 1939 production showed 2,227,000,000 lb. as a total with staple yarn at 1,082,000,000 lb. and filament yarn at 1,145,000,000 lb.) For the first time, the relatively new staple yarn exceeded filament yarn in production. To a large extent, this was the result of German concentration upon a fibre that more nearly resembles cotton and wool than filament yarn and is less expensive to make. The other axis powers shared in this growth but not to the same extent. Japan remained at about the same level but Italy showed some increase. A cheap synthetic fibre that can be produced in large volume and give the soft warm effect of the natural fibres no longer available is the answer to the needs of countries cut off from world trade. At the same time, rayon filament yarn world production decreased sharply as it was considered more of a luxury product.

In the United States, not only staple fibre but filament yarn showed a marked increase. The combined production of U.S. rayon filament and staple fibre represented over a third of the world's total supply, the first time that one country has accounted for such a large share. Rayon filament yarn produced in 1940 amounted to 390,100,000 lb. compared with 329,600,000 in 1939. Staple fibre rose to 81,100,000 lb. in 1940 from 51,300,000 in 1939. Rayon has virtually become the fibre used in the great mass of garments and household textiles that formerly employed cotton, silk and wool. Silk had already lost its markets in garments but wool recorded an increasing loss to rayon during 1940. Mixed wool and spun rayon fabrics for men's clothing, especially, became more established. At the same time, all spun rayon (staple fibre) fabrics continued to supply people of low incomes with well designed so-called sportswear or tailored type clothing formerly found only in fairly high priced woollen garments.

Spun rayon blankets were introduced widely during 1940. They were offered for their lightness and attractive colouring, as well as their price, which was lower than that of woollens of the same weight and texture. Brushed surface rayons made from the staple fibre continued to grow in favour for children's clothing and adults' sportswear. In household linens, rayon towels were featured both in imitation of the linen weave and the rougher "turkish" textures, and the rayon tablecloth became commonplace.

Price movements of the other textile fibres and rayon showed an interesting difference in trend. Other fibres fluctuated widely at times (notably wool in 1940, presumably because of defence orders), but rayon showed little or no change. After Oct. 1939 the average monthly price of rayon yarn remained at 53 cents. In the same period, raw wool was $1.14 in Oct. 1939, dropped to a low of 88 cents in July and Aug. 1940 and increased to $1.10 by Dec. 1940. Raw silk was $3.24 in Oct. 1939, rose to $3.89 in Dec. 1939 and dropped to $2.55 by Dec. 1940. The comparatively stabilized price of rayon, as contrasted with both silk and wool, combined with satisfactory wear and appearance, is one of its chief attractions for the manufacturer of rayon products and is an important factor in assuring its further progress.

While not strictly termed rayon or rayon manufactures, reference should be made to the 1940 development of so-called plastics, or synthetic fibres made from a plastic base. Most notable was nylon, for its use in hosiery, but vinyon was entering actively into the commercial consumer market during the last six months of 1940. The first public sale of nylon hosiery was on May 15, 1940 and the demand was so great that stocks were exhausted rapidly. Prices for nylon hosiery were substantially higher than for silk but by Dec. 1940, after seven months of consumer experience, manufacturers were allotting deliveries to retailers by



RAYON AND RAW SILK consumed in the United States

stipulating that a proportionate amount of silk hosiery must be purchased to secure nylon. Retail prices of nylon hosiery ranged from $1.35 to $1.95 a pair, as contrasted with an average price of about 85 cents for silk. Nylon for fabrics was still in the experimental stage, largely because of the limited supply of yarn for the mills. Both in laces and velvets, however, nylon was featured for its superior elasticity and resistance to pressure.

Vinyon was introduced to the public during 1940 in a glove fabric and in felts for hats. This is the fibre that, during the previous two years, had been used in industrial filter cloths, because of its resistance to mineral acids and alkalis, as well as its high strength, both wet and dry. Like nylon, vinyon does not absorb moisture. Dirt and stains do not penetrate and are easily removable in washing; nor do the fabrics shrink. Quick drying properties are an added asset in these two new fibres.

Use of rayon and other synthetic fibres in military and naval equipment, in 1940, was primarily in experiments to take the place of imported fibres or those limited in supply. Nylon parachutes to replace the silk fabric were in the process of practical test by the army. Fiberglass to cover aeroplane wings was used in educational contracts because of its fireproof quality and light weight. Fortisan, considered by some military authorities as superior even to nylon and vinyon, was another of the new synthetics being tried in parachutes. In clothing, rayon linings were substituted for cotton or silk in flying cadets' uniforms and experimental spun rayon and wool combination fabrics for uniform use were ordered by army officials. With the exception of cartridge bag cloth, all silk articles, including sewing thread, were in the process of being replaced by one or another of the synthetic fibres. Wool still held its own but, as noted, experiments were under way to utilize in uniforms and other garments, normally specifying the natural wool fibre, a combination of wool and spun rayon or all spun rayon fabrics which have already proved their worth in men's sportswear. Civilian use for rayon, however, was felt to be the most valuable contribution of the synthetic fibres to defence purposes. Use of rayon would mean that production of textiles would be a wholly domestic industry since the raw materials for rayon were produced in the United States and all subsequent processing plants were located in the U.S.A. Second, with a rising cost of living and greater tax drain upon the population to pay the cost of defence, the use of rayon, with its lower cost, would naturally help in solving the average customer's budget. (*See* also CELLULOSE PRODUCTS; INDUSTRIAL RESEARCH; RUBBER AND RUBBER MANUFACTURE; SILK AND SILK MANUFACTURE; TEXTILE INDUSTRY.)

(I. L. BL.)

Reciprocal Trade Agreements: *see* TRADE AGREEMENTS.

Reclamation: *see* CANALS AND INLAND WATERWAYS; DRY FARMING; FLOODS AND FLOOD CONTROL; FORESTS; IRRIGATION; SOIL EROSION AND SOIL CONSERVATION.

Reconstruction Finance Corporation,

one of several agencies comprising the Federal Loan agency, under the supervision of the Federal Loan administrator, may perform all functions it is authorized to perform under law to close of Jan. 22, 1947, or such earlier date as the president may authorize. It was created by "an Act to provide emergency financing facilities for financial institutions, to aid in financing agriculture, commerce, and industry, and for other purposes," approved Jan. 22, 1932, which may be cited as the "Reconstruction Finance Corporation Act." The powers of the corporation were increased and the scope of its operations extended or otherwise affected by subsequent legislation.

The corporation was organized and began operations on Feb. 2, 1932. (E. SM.)

Reconstruction Finance Corporation—Summary of Activities Feb. 2, 1932 through Dec. 31, 1940

	Authorizations	Disbursements	Repayments and Other Reductions
For benefit of agriculture	$ 2,604,071,430.83	$ 1,450,650,426.06	$1,446,851,462.93
To open banks to meet demands of depositors	1,334,787,161.08	1,138,233,619.27	1,075,668,017.61
For distribution to depositors in closed banks	1,388,624,715.93	1,032,190,862.01	964,909,120.65
For bank capital (including Export-Import Banks)	1,544,502,689.00	1,243,185,206.56	686,473,957.46
For self-liquidating projects (including PWA municipal securities)	1,142,982,665.94	903,415,464.47	757,144,082.06
To business enterprises	570,795,629.02	240,118,867.51	118,302,757.18
For loans for national defence	913,884,108.55	63,707,398.39	320,797.34
For purchases of stock—national defence	20,000,000.00	13,000,000.00	
To drainage, levee and irrigation districts	140,861,808.39	90,850,363.04	7,390,550.59
To railroads (including PWA railroad securities)	1,454,597,165.54	985,888,344.70	499,716,606.05
For loans to and capital of mortgage loan companies (including $25,000,000 capital the RFC Mortgage company and $11,000,000 capital Federal National Mortgage association)	708,904,275.19	545,949,045.24	356,408,334.45
For loans to and capital of insurance companies	138,914,750.19	125,168,209.81	100,555,062.06
To building and loan associations (including receivers)	164,700,533.45	122,657,241.60	118,389,062.96
To public school authorities	25,297,050.00	22,865,175.00	22,309,000.00
Catastrophe rehabilitation loans	16,184,520.95	12,003,055.32	10,768,972.92
To state funds for insurance of deposits of public moneys	13,087,715.88	13,064,631.18	13,064,631.18
For mining, milling and smelting businesses	16,563,100.00	6,490,409.40	2,713,696.95
For other purposes	669,057.07	614,813.85	603,739.27
Total—By directors of the corporation	$12,199,428,377.01	$ 8,010,053,133.41	$6,181,589,851.66
Allocations and loans to other governmental agencies and for relief by direction of congress	3,204,398,637.69	2,956,946,055.33	2,782,448,480.79†
GRAND TOTAL	$15,403,827,014.70	$10,966,999,188.74	$8,964,038,332.45*

*Includes $36,566,518.72 credited on indebtedness for property taken over for debt.
†Includes $2,728,286,823.03 cancellation of corporation's notes pursuant to act of congress approved Feb. 24, 1938.

Red Cross.

The Red Cross is the internationally recognized symbol of agencies in most countries for relief of sufferers in war and civil calamities. The agencies operate under the International Red Cross formed in Geneva in 1864 to which 63 national societies are signatory to organize impartial aid for sick and wounded in time of war, and the league of Red Cross societies with headquarters in Geneva which specializes in peacetime relief work.

The American Red Cross was organized in 1881 and signed the Geneva convention in 1882. It carries on extensive disaster relief operations and, since founding, has expended $144,000,000 to aid the victims of more than 2,600 disasters the world over. It is supported entirely by public contributions and has never been government financed. It sponsors the American Junior Red Cross with a school boy and girl membership of 8,588,398 and since 1914 has awarded life saving certificates to more than 1,075,000 persons completing training courses, and since 1910 more than 2,460,000 certificates to persons instructed in first aid technique. Certificates have also been issued to more than 1,073,000 women and older girls who have taken Red Cross instruction in how to care for the sick at home.

To combat accidental injuries and deaths the American Red Cross has established almost 6,000 emergency highway first aid stations and mobile units, and annually gives instruction to approximately 10,000,000 householders on the removal of hazards likely to cause home and farm accidents.

In 1939–40 the American Red Cross provided food, clothing, shelter, rescue, medical and nursing aid and rehabilitation assistance to more than 100,000 victims of 102 disasters in the United States at an expenditure of $655,758.

During the same period Red Cross public health nurses gave care to 334,194 persons and made 1,038,363 visits on behalf of the sick. In their school and pre-school work these nurses co-operated with doctors in examining 618,623 children. In 459 communities 638 Red Cross nurses carried on this essential work, and 1,825 graduate nurse instructors taught classes in home hygiene and care of the sick to 61,855 persons who passed examinations on the subject. The first reserve of the Red Cross nurses' reserve corps was swelled to 16,894 picked registered nurses ready to act in any emergency of peace or war, and the total Red Cross nurses' reserve corps numbered 43,138.

Volunteers served a total of 11,836,107 hours in such specialized work as producing 2,098,571 garments for the needy in the United States and various countries in Europe; 9,958,201 surgical dressings and 18,834 Christmas bags for U.S. soldiers, sailors and marines stationed overseas; 1,145,963 pages hand transcribed and duplicated in Braille for distribution among blind readers.

Through field directors stationed at army, navy, marine corps and coast guard stations and Red Cross chapters, help was given in 1939 to more than 53,000 enlisted men. Through Red Cross workers in 3,545 chapters, 140,357 war-disabled veterans were helped and other Red Cross personnel dealt with the problems of 58,505 ex-service men and their families.

In 1939–40 Red Cross chapters aided 121,108 civilian families with social and financial guidance, and 125 nutritionists and food experts assisted 74 Red Cross chapters throughout the U.S. in passing along information on the value of health-protecting foods and adequate diets.

The American Red Cross offered relief aid to all belligerent nations following commencement of European hostilities in Sept. 1939. Subsequently, relief was given in England, France, Poland, Finland, Norway and Luxembourg. Belgian and Dutch refugees in France and England also were aided. China likewise received relief.

An army of volunteer women in Red Cross chapters in the U.S. produced 825,000 garments and 6,600,000 surgical dressings, shipped abroad prior to Sept. 1940. Thousands of tons of food, medicines, ambulances, hospital equipment and other relief essentials were purchased in the United States and shipped abroad. Cash funds were allocated to Red Cross societies in combat areas and to American Red Cross delegates in Europe to purchase supplies needed on an emergency basis.

As of Aug. 31, 1940, a total of $5,809,204 had been spent on European war relief and an additional $3,051,614 had been committed for expenditure, making a total of $8,140,818. To finance these extensive operations, the Red Cross appealed to the U.S.

for a $20,000,000 war relief fund, which was oversubscribed.

(G. S. Br.)

The original function of a national Red Cross society in war was to aid the sick and wounded of the armies. As military forces developed medical corps and the character of warfare changed, Red Cross activities became more diverse. Protection of civilian populations, extension of relief to the bombed-out and evacuated, service for prisoners of war and establishment of bureaus of information were added to the traditional wartime activities of rescue, treatment and rehabilitation of soldiers.

Great Britain.—In Great Britain the British Red Cross, formed in 1870, and the Order of St. John of Jerusalem which operates ambulance units, established a joint War Organization to conduct Red Cross activities. Under military control, the War Organization operated hospitals and convalescent homes, produced and maintained stores of medical supplies for the military services, organized detachments of men and women for the protection of civilians, operated an information bureau seeking news about wounded, missing, or prisoners of war and prepared and dispatched parcels for war prisoners in enemy territory. It was assisted by the other Red Cross societies of the British empire.

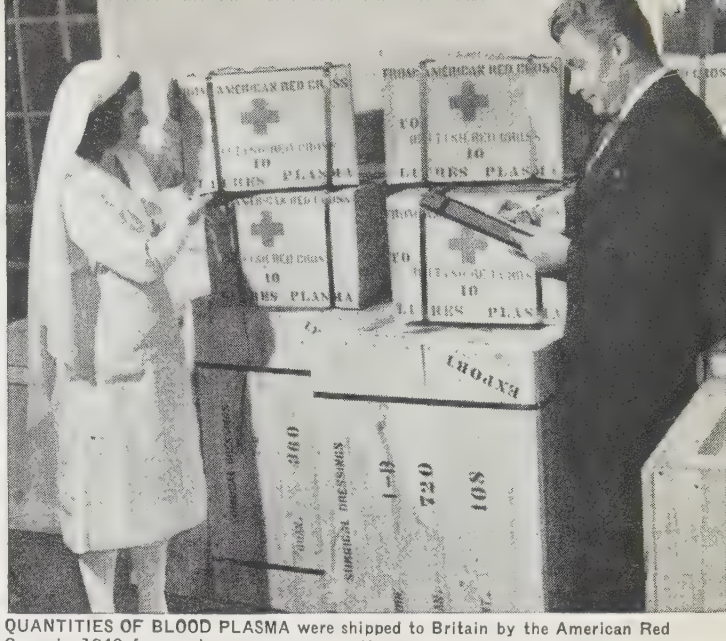
France.—The French Red Cross, organized in 1864, was until 1940 composed of three societies, *Société française de Secours aux Blessés Militaires, Association des dames françaises* and *Union des femmes de France.* From Sept. 1939, until June 1940, the society operated ambulance units, maintained auxiliary hospitals, recruited and trained personnel for military health service and organized air raid protection. After the armistice of June 1940, the three separate societies were disbanded and a single organization formed under the name of the "French Red Cross."

Germany.—In 1921 the Red Cross societies of the several German states were combined to form a federated German Red Cross. In 1937 it was reconstituted and placed under the direction of the reich minister of interior. The German government recognized it as a voluntary society serving as an auxiliary to the medical services of the armed forces. The German Red Cross enrolled and trained "sisters" (nurses) for service in military hospitals. It operated ambulance trains, maintained an information bureau on war prisoners, received, aided and directed refugees, sent parcels to prisoners in enemy hands, directed civilian relief in occupied territories and organized civilian air raid protection. Local committees functioned in the established military areas, conducting first aid programs, operating highway emergency stations and organizing men's and women's units for various duties.

Italy.—The Italian Red Cross, originally organized in 1864, was engaged primarily in health and protective medical work. It operated ambulance trains both at home and in the colonies, trained both volunteer and professional nurses and health officers, organized air raid protection and maintained first aid posts and motorized ambulance service. Its work in preventive medicine was continued under wartime conditions. Local committees sponsored anti-malaria and anti-tuberculosis efforts, maintained clinics and operated camps for children. In overseas work the Italian Red Cross operated ambulances and mobile surgery and X-ray units and assisted in public health work in such areas. (P. E. R.)

Referendum: *see* Initiative and Referendum.
Reforestation: *see* Forests.
Reformed Church: *see* Presbyterian Church.

Refugees. The year 1940 brought no surcease to refugees in China and in Europe. In China the 30,000,000 refugees, uprooted since the beginning of the war with Japan, continued their trek in two great internal movements; one from the central and southeastern regions to the southwest, and the other from the northeast to the northwest. In Europe, to the 250,000 Spanish refugees in France and the 140,000 German, Austrian and Czech refugees in the western transit countries at the beginning of the year were added some 3,000,000 to 4,000,000 Poles and Polish Jews, put to flight eastward and southward by the German invasion of Poland. As a result of the Russian conquest in Finland 400,000 people had to be resettled within the narrow confines of the shrunken borders of their country. A similar movement of lesser proportions followed the German invasion of Norway in April.



QUANTITIES OF BLOOD PLASMA were shipped to Britain by the American Red Cross in 1940 for use in emergency operations

The terrifying advance of the German armies into the Low Countries in May drove 3,000,000 people from Luxembourg, Holland, Belgium and northern France into southern France, clogging the roads and impeding the operations of the allied armies. After the collapse of France the great majority of these returned in despair to their villages to pick up the threads of living again as conquered peoples.

The refugee migrations of 1940 exceeded in numbers and in stark tragedy all earlier migrations resulting from the World War of 1914–18, political revolutions and persecutions. They were quick and violent in action involving whole populations and were shocking to the sensibilities of the civilized world.

The war of 1914–18 had precipitated substantial movements of Turks, Greeks and Bulgarians. Under bi-lateral treaties and financing and direction by the League of Nations these had been controlled and orderly in comparison, and settlement had been facilitated because they consisted chiefly in exchanges of populations, the refugees returning to their native countries to resume their own cultures and citizenships.

The Russian and Armenian refugees had spread westward through Europe during the decade from 1920 to 1930 in a period of rising prosperity. In a sense they had set the patterns of refugee experience for the 400,000 refugees who were forced to leave Germany after the nazi revolution in 1933, Austria after the Anschluss of 1938, and Czechoslovakia after its absorption in 1939.

The Russian and Armenian refugees of the preceding decade had experienced the vicissitudes of statelessness and the inhospitality of governments which offered them uncertain civil status and meagre living from the most arduous employments. Even as late as 1938 the League of Nations reported almost 1,000,000 of these earlier refugees still unsettled and with no prospects of settlement. Their lot was made worse by the German advance into western Europe in 1940.

The refugees from central Europe burst upon a world in the throes of economic depression beset by unemployment and decidedly less hospitable. They were predominantly urban in character, intellectuals, professionals, merchants, bankers, technicians and artisans. Throughout the world there had been a drift of populations from rural to urban areas. The cities of the receiving countries in Europe and overseas feared the accretions to their populations which this tide of refugees would bring. Under these circumstances this dispersion of central European refugees could hardly have taken place in such numbers unless forced by the persecutions and terrors of the nazi government in Germany or by the advance of the German army into Poland.

GOING AND COMING in May 1940. British troops on their way to the battle front in Belgium pass refugees fleeing before the German advance

Switzerland, France, Holland and Belgium had accepted refugees in flight across their borders on humanitarian grounds, but in the confident hope that they might soon migrate again to settlements in overseas countries. Early in 1939, their absorptive capacities exhausted, they were forced to seal their borders hermetically. Thereafter there was forced dispersion of refugees overseas to Latin and South American countries and to the near east. Many ships loaded with hopeless refugees wandered for weeks and months in the eastern Mediterranean searching for a port at which to land. Illegal immigration became a difficult problem for the British government in Palestine.

By 1940 Palestine had absorbed over 250,000 Jewish refugees from Poland, Rumania and Germany. The United States accepted some 70,000 to 90,000 refugees from central Europe from 1933 to 1940, and South American states equal numbers.

The outbreak of war in Poland in Sept. 1939 and its spread to western Europe in the spring of 1940 interfered seriously with the flow of refugees from Europe during the year. Transportation facilities were greatly reduced and fears of potential "fifth columnists" among the refugees, after the conquests of Norway, the Low Countries and France, tended to close the doors of overseas countries to the greatly increased numbers of refugees struggling desperately to get out of Europe. After Italy entered the war and the Mediterranean became a scene of war operations Portugal became the only port of westward exit. Refugees in limited numbers from central Europe thereafter travelled across Siberia and the Pacific ocean to reach the western hemisphere.

The war in Poland drove over 100,000 Polish refugees into the Baltic countries, Rumania, Hungary and Yugoslavia. Polish Jews fled southward and eastward into soviet Poland, and later those who had found temporary refuge in the Baltic countries faced new pressures when soviet Russia absorbed Estonia, Latvia and Lithuania. During Nov. and Dec. 1940 reports of refugee trains dispatched daily to Siberia loaded with refugees from soviet Poland and the Baltic countries were persistent. Although no authoritative figures became available conservative estimates placed the numbers in Siberia at the end of the year at 300,000.

The German reorganization of Poland and the transfers of territories during the year in the Baltic and Balkan countries resulted in many cross movements of populations. Baltic Germans were repatriated to the former area of Poland that was absorbed into the German reich. From this same area Poles and Jews were driven eastward. During the fall over 300,000 Germans were in process of repatriation from Bukovina, Bessarabia and Rumania to Germany. Earlier in the year some 200,000 Austrians had left their homes in the Italian Tyrol for new homes in Germany and Austria.

In the flight from Dunkirk in June some German, Austrian and Czech refugees and smaller numbers of Dutch and Belgians got to England with the retreating British army. England had previously given temporary refuge to 65,000 refugees from central Europe. In 1939 these refugees had been classified according to their loyalties and certain classes interned. After the collapse in Flanders all were interned regardless of classification. During the late summer many of these refugees were removed to Canada, Australia and New Zealand along with prisoners of war. When the bombing of England began, organized efforts to rescue British children were made simultaneously in Canada, the United States and Australia. Approximately 3,000 children were sent to Canada, equal numbers to the United States and some to Australia before the British government cancelled the schemes because of the dangers of losses of transports at sea.

The dual German effort to press the war to a conclusion and to establish the "new order" in Europe produced many minor movements of special groups such as Czech, Danish, Norwegian, Dutch and Belgian workers to the farms and war industries of the reich. Taken together these transfers subjected hundreds of thousands to forced labour beyond the borders of their own countries.

Following the incorporation of Luxembourg and Lorraine into provinces of the German reich, non-Aryan refugees were expelled from Luxembourg and 10,000 to 20,000 of the French population of Lorraine were moved into unoccupied France. The resistance of the French government probably prevented the transfer of larger numbers from Lorraine. In November over 10,000 Jews, mostly elderly people, were transported from Baden and the Palatinate to unoccupied France, greatly increasing the population of the concentration camps in this area. Refugees who managed to be released from these camps reported sordid conditions of overcrowding, inadequate sanitary provisions, lack of proper bedding, poor food and slight protection from the cold.

As 1940 closed there were approximately 100,000 refugees from central Europe and about 50,000 unabsorbed Spanish refugees

in unoccupied France desperately anxious to emigrate overseas. In November and December exit through Spain became increasingly difficult. In Lisbon and Oporto there were over 8,000 refugees, safe for the moment, but living in daily fear that Spain and Portugal might be invaded by Germany.

While hopes of emigration existed for some of the refugees in southwestern Europe, prospects of escape for the racial and political refugees locked in central and southwestern Europe dwindled. These were conservatively estimated to be 240,000 in Germany, 80,000 in Czechoslovakia, 1,250,000 in Hungary and Rumania, 1,500,000 in Poland and 30,000 to 40,000 in Italy.

International action on behalf of refugees was at a comparative standstill during the year. Relief activities were severely restricted by the blockade controls and opportunities for emigration were greatly reduced. The project to settle refugees in the Dominican Republic, started under the auspices of the Intergovernmental committee in 1939, proceeded encouragingly. The first 500 settlers were already establishing homes on the land in the Sosua area at the end of the year and preparations had been completed for the reception of 1,000 additional settlers already selected in Europe. A scientific survey was under way to determine the possibilities of cash export crops for the refugee settlement. Conclusive demonstration had already been made that central Europeans could do their own work in the open in the sub-tropical area of the Dominican Republic without detriment to health and that self maintenance was possible by the refugees.

Official bodies such as the League of Nations High Commissioner for Refugees, the Intergovernmental committee, and the International Labour office were unable to take effective action during the year because of the impediments to intergovernmental collaboration created by the war. While planned action toward the solution of refugee problems by official and private bodies proved difficult during the year, there was growing realization of the enormity of the problem to be faced when the war ended. (*See* also ANTI-SEMITISM; CHILD WELFARE; CHILE; JEWISH RELIGIOUS LIFE.)

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Reichenau, Walter von (1884–), German soldier, often spoken of as "Hitler's favourite general." Born at Karlsruhe, he entered a field artillery unit in 1903 and was assigned to the general staff during the World War of 1914–18. After Hitler's assumption of power he became successively chief of staff of an army corps, general in command of an army corps and secretary of state to the minister of war. During the campaign of May–June 1940 he commanded the central group of armies and directed the drive which routed the Allied troops in Flanders. He was created field marshal by Adolf Hitler on July 19.

Relay Racing: *see* TRACK AND FIELD SPORTS.

Relief. During 1940 two factors influenced policies governing relief in the English-speaking world: the European war and political pressure to liberalize public assistance. The war led each country to pass special legislation protecting enlisted men, persons engaged in the defence industries and, in England, civilians affected by evacuations, by radical changes in industry or by injuries suffered from the enemy. In Canada, dependents of enlisted men received allowances from the dominion treasury; their rights under unemployment insurance were protected by the same authority. In the U.S. no provisions were made in 1940 for enlisted personnel, although at the last session of congress in 1940 various proposals were submitted.

England adopted the widest special war coverage yet attempted. Evacuation of three-quarters of a million children, sometimes with their mothers, was effected from bomb-target cities and the cost of caring for them was borne by the national treasury. Civilian losses due to the war, such as injury or death in an air raid, destruction of property or of business were responsibilities taken over by the Unemployment Assistance board, renamed, because of its wider function, the Assistance board. It was financed by the national treasury. No reports seem to be available of the amounts spent, or the numbers benefited by the above two war services.

In the liberalization of relief, there was a tendency to associate relief with the insurance schemes. In the United States, the old age insurance plan was revised in the summer of 1939, and effective beginning with 1940, in order to write in as beneficiaries some whose equity in the fund would not entitle them to such benefits: persons reaching the age of 65 by 1940 and who had therefore not built up much of an equity in the fund, wives of the insured and survivors of insured workers. However, such violation of actuarial requirements in old age insurance was adopted avowedly in all European systems of old age insurance from their inception as the fair method to those whose age at the inauguration of the systems precluded them from securing any but a microscopic income on reaching 65.

Canada in 1940 set up a simple and logical system for care of the able-bodied unemployed. It established a national scheme, financed and administered by the dominion for their care either by insurance or by work relief or by relief alone. It turned back to the provinces complete responsibility for all other relief, whether it be care of the sick, the aged or children. The dominion government would, however, enter the field, wholly caring for any unusual agricultural distress, such as was caused by the drought in the wheat-raising provinces a few years before and share with the provinces any scheme for old age insurance.

In England the renamed Assistance board was given responsibility for supplying supplementary aid to the aged receiving an insufficient income from their old age insurance benefits, in addition to its care of the able-bodied unemployed who exhausted their insurance benefits and the war services. The Labour members of parliament urged the government to increase the benefits under old age insurance, but instead the government passed a provision that beneficiaries who could show need would be eligible for supplementary aid on a budgetary basis from the Assistance board.

While there were agitations in all countries under review for the establishment of flat old age pensions given irrespective of need, only New Zealand granting $50 a month to all over 65 years of age adopted such a plan. The experiment was too new for a judgment on its practicability.

In the United States relief was set up in the same complicated pattern under which it had operated since 1935: the federal government furnishing work for some unemployed able-bodied persons, varying in 1940 from one and two-thirds million workers to two and a third million and costing from about $95,000,000 to $125,000,000 a month, but assuming no responsibility for the unemployed whom it did not or could not draw into its work projects. The federal government also paid half the cost of relief of the aged, the blind and of dependent children in their homes. It left all other need to the care, but more often to the neglect, of local authorities.

Taking a leaf out of Swedish experience with surplus agricultural produce in using it to feed the portion of the population less able to provide itself with adequate food, the federal gov-

ernment contributed to general relief after 1936 by buying up surplus food directly from farmers, under certain conditions, and then distributing it to persons on relief of almost any kind, to schools for lunches for children, to workers on WPA or those certified for it, to those receiving old age assistance, aid to the blind and to parents of dependent children and to those on agricultural relief. Late in 1939 an ingenious scheme known as the food stamp plan was suggested by retail and wholesale commission dealers as a substitute for this direct distribution and to replace these goods within the channels of trade. Each person or family certified as in need was given 50% additional allowance on his food budget in the form of stamps, which he might use to purchase certain designated articles of food at any food mart. This was still experimental and was being used only in a limited number of communities by the end of 1940. Surplus commodities elsewhere continued to be distributed directly as formerly.

The outstanding feature in administration of relief in the United States was the belated entrance of the merit system of personnel appointment wherever the federal government was involved in the field of assistance or insurance. Some states resisted and temporarily lost federal aid, others tried to postpone its adoption. But its practically universal adoption was a step toward placing the administration of the social services throughout the United States upon a plane of competency, freed from political influence. (*See* also MUNICIPAL GOVERNMENT; SOCIAL SECURITY; UNEMPLOYMENT; WORK PROJECTS ADMINISTRATION.)

BIBLIOGRAPHY.—Publications of the Federal Social Security board and of the Canadian Bureau of Labour for 1940. (F. J. B.)

Religion. During 1940 students of the history of religion felt driven to contemplate the possibility of a reversal of its centuries of progress and of the serious institutional weakening of religion throughout the world for an indefinite time. Yet the report on "the state of the church" made to the biennial session of the Federal Council of the Churches of Christ in America declared that, in the upheavals of mankind, the church remains the least shaken of our major institutions. In a day of progressive loss of political and economic security, its own fellowship has held under all strains and its unity has increased. The World Council of Churches in process of formation reached a membership of 70 communions throughout the world and continued to gain adherents in all continents during 1940. One hundred and sixty-eight "orphaned missions" separated from their German, Belgian, Danish, Dutch and French support by the war were cared for by denominational missionary agencies co-operating through the International Missionary council. British churches both in England and South Africa safeguarded and aided the missions of nations with which they were at war. Communication was actively maintained among all branches of the church and extensive help extended to war prisoners and refugees. Almost complete loyalty to Christian fellowship continued among previously associated Christian leaders of the warring nations. Representatives of the oecumenical movement of the non-Roman churches conferred directly with the Pope concerning war work. In many parts of Europe Catholics and Protestants increasingly made common cause, and active interfaith cooperation in the United States and Canada was a strong influence against prejudice and in behalf of constructive national unity. The church, in brief, was in 1940 the most effective international agency which survived the stress of the times.

In contrast to easygoing views of religion cherished by 20th century liberalism, necessary conflict was stressed between the requirements of the absolute and eternal values and verities and moral life in a world in which no "good" choices are possible. A sense of tragic tension consequently came to characterize religious experience, forced it to profounder levels, and was accepted as essential and normal in any truly realistic attitude toward existence.

A certain return to religion on the part of secular culture brought it notable recruits and allies in 1940. In line with a newly favourable concern with religion by literature, the Conference on Science, Philosophy and Religion, held at the Jewish Theological Seminary of America in New York in September, attempted to bridge the gap between science, philosophy and theology and to reinstate the fundamental realities of religion among the cultural values confessed by the contemporary mind.

Similar reinforcements to religion came from the world of practical affairs. A much discussed editorial in *Fortune* (Jan. 1940) called upon the church to save civilization by teaching "absolute spiritual values." This was symptomatic of a widening conviction in lay circles that only the interiorizing of moral authority through religious faith and discipline could check the disintegrating forces of the age. Indeed, so many recruits from secular fields flocked to the banner of religion that religious leaders began to inquire whether the unrealized motive might not be concern for the preservation of the social and economic *status quo*.

A new emphasis on religion was outstanding in the field of public education in the United States. From President Roosevelt and authorities of national educational associations down to state and city authorities, the role of religion in education was being newly emphasized. The same stress marked the writings of Christopher Dawson, Middleton Murry and T. S. Eliot in England. In the United States, legislation, which hitherto restrained religion in public education, was encouraging or requiring it in numerous instances. There was a rapid extension of local opportunity for religious weekday education on released school time.

As the political aspect of liberal culture, democracy itself was seeking the reinforcement of religion in its struggle against totalitarianism. Generally, the church declined to identify itself with the fortunes of any particular political system. At the same time, it had to recognize that all its objective values were actually wrapped up with particular human cultures. Religious opinion in the surviving democracies consequently largely came to pin its hopes upon their victory in the European war as the only outcome which could assure religion the basic conditions of normal existence. Within the democratic states themselves the church became newly sensitive to tendencies toward interference with religion; as evidenced, for example, in widespread Protestant opposition in the United States to the appointment of Myron C. Taylor as the President's representative to the Vatican, and in a widespread critical attitude toward American social security legislation as applied to religious workers, as a possible encroachment upon the prerogatives of the church.

The most crucial test of religion in the modern world obviously related to its attitude toward war. Almost universally the churches reiterated the conviction that war is sinful. They repudiated it as a method of adjusting human difficulties. But on every specific war measure, religious opinion divided. The conflict lay essentially between the pacifist attempt to practise absolute values, on the one hand; and, on the other, the sense of involvement of all values in the inevitable practical consequences of war. In Great Britain, Canada and the United States religious conviction enforced a marked difference in the procedures of governments toward conscientious objectors as compared with those during the war of 1914–18. A broader recognition of the rights of conscientious objectors to exemption from military service was accorded. At the same time the rank and file of religious sentiment in all nations fell in behind national policy, though more discriminatingly than ever before, and more critically of attempts to bring religion into unthinking partnership with supposed

national necessities.

As war covered an ever larger proportion of the earth's area and took unprecedentedly destructive forms, a decreasing demand for any immediate blueprint of conditions of peace and reconstruction was evident. But a seminar held in connection with the biennial session of the Federal Council of the Churches of Christ in America in December called for the early organization of a competent body, representative of all constructive human interests, to draft the outlines of a world order based on religious insight; and the demand for such a sketch was continuous in Christian publications in Great Britain throughout 1940 as well as from the very beginning of the war.

The conviction that religion possesses the basic principles of a permanent world order and the hope of building a new world on religious foundations thus remained fundamental for all who hold to the Hebraic-Christian tradition. (H. P. D.)

Religious Denominations: *see* CHURCH MEMBERSHIP.

Reorganization, Governmental: For regrouping of U.S. offices and bureaus under Federal Security Agency, Federal Works Agency, Federal Loan Agency, etc., *see* listings under GOVERNMENT DEPARTMENTS AND BUREAUS.

Representatives, House of: *see* CONGRESS, UNITED STATES.

Republican Party.

As the Republican party entered 1940, preparation for the presidential campaign was the principal objective of the national organization. John D. M. Hamilton remained at the helm of the Republican national committee, and Franklyn Waltman, a former newspaper man, continued as its director of publicity.

Through its research division, under the direction of Olin Glenn Saxon, professor of economics at Yale, the national committee prepared factual studies on current issues. These were made available to Republicans in congress and to party workers throughout the U.S.

When the 76th congress convened for its regular session on Jan. 3, 1940, the Republicans held 23 senate and 164 house seats. Senator Charles L. McNary of Oregon and Representative Joseph W. Martin, Jr., of Massachusetts, continued, respectively, as Republican senate and house leaders. Representative J. William Ditter of Pennsylvania served as chairman of the Republican Congressional committee, and Senator John G. Townsend, Jr., of Delaware headed the Republican Senatorial committee.

As in 1939, Republicans in congress showed increased activity. On several occasions, they joined with independent Democrats to defeat or sidetrack important administration bills. With few exceptions, Republicans supported the president's proposals to strengthen the army and the navy, and a Republican representative, James W. Wadsworth of New York, was the co-author, with Senator Edward R. Burke, Democrat of Nebraska, of the selective service bill that passed congress on Sept. 14, 1940.

Republicans in both houses opposed almost solidly the administration's proposal to extend the Trade Agreements act for three years. House Republicans, by a majority of over 100, voted against the $212,000,000 appropriation for parity payments to farmers and a majority of 100 Republican votes was also recorded against a $50,000,000 increase in the appropriation for the Civilian Conservation corps. Though opposed by a majority of house Democrats, only one Republican vote was cast against the bill to extend to state and local government employees, paid in whole or part from federal funds, the prohibitions imposed by the 1940 Hatch act on political activities by federal officeholders. House Republicans voted, in a ratio of approximately six to one, for a 60-day trial of volunteering before resorting to conscription.

The Election.—On Feb. 16, 1940 under call of Chairman Hamilton, the Republican national committee met in Washington. The committee set June 24 as the date for the national convention and picked Philadelphia as the convention city.

In the early months of 1940, three Republicans appeared to hold a commanding lead in the race for the Republican presidential nomination. These three were Thomas E. Dewey of New York, Senator Arthur H. Vandenberg of Michigan and Senator Robert A. Taft of Ohio. As a result of his defeat by Mr. Dewey in the Wisconsin and Nebraska primaries in April, Senator Vandenberg lost ground and Mr. Dewey and Senator Taft entered the convention as the leading candidates.

Governor Harold E. Stassen of Minnesota delivered the keynote speech, as temporary chairman, at the opening of the Republican national convention at Philadelphia on June 24. Representative Joseph W. Martin, Jr., was the permanent chairman. Opposing participation in foreign wars, the Republican platform urged a stronger national defence, demanded a slash in federal expenditures and sharply criticized the concentration of power in the executive by the party in power.

"I STAND BEFORE YOU without a single pledge or promise . . ." said Wendell L. Willkie on June 28, 1940, to the Republican convention at Philadelphia which had chosen him as the party's presidential candidate early that morning

After both Mr. Dewey and Senator Taft had failed to secure the necessary majority, the convention, on the sixth ballot, nominated a "dark horse" candidate, Wendell L. Willkie, whose candidacy, in the months immediately preceding the convention had gained increasing strength among rank-and-file Republicans. Senator Charles L. McNary of Oregon was picked as his running mate. On July 7, Mr. Willkie appointed Representative Joseph W. Martin, Jr., as chairman of the Republican national committee, and on July 22, he announced the appointment of four anti-Roosevelt Democrats to organize a national independent movement in support of his candidacy. In his acceptance speech, on Aug. 17, he endorsed many of the New Deal's domestic measures. During the campaign, Mr. Willkie travelled widely, making scores of speeches.

In the Nov. 5 elections, Mr. Willkie received 22,333,717 votes as compared with 27,243,604 for Mr. Roosevelt, according to a compilation made by the Republican national committee. This was the largest popular vote ever given a Republican presidential nominee. Mr. Willkie, who won 82 electoral votes, carried ten states: Colorado, Indiana, Iowa, Kansas, Maine, Michigan, Nebraska, North Dakota, South Dakota and Vermont. Though the Republicans increased their strength in the senate by five, the Democrats gained in the house.

In a radio address on Nov. 11, Mr. Willkie urged that congress, because of the emergency arising from the European war, remain in session. Republicans in both houses opposed adjournment. As the year drew to a close, Republican leaders indicated that they would support the president's program for increased aid to Britain. (*See* also ELECTIONS; UNITED STATES.) (O. McK.)

Resins, Synthetic: *see* PLASTICS INDUSTRY.

Retail Sales. The sales for 1940 of all types of United States retail stores have shown an increase of approximately 8% over 1939. The department of commerce estimates that the total volume of business reached by all types of retail stores was $45,500,000,000 for the year 1940.

The largest sales increases in dollar volume were shown by the two major combination retail-mail-order companies. The gain in 1940 sales over 1939 for Sears was 13·9% and the gain for Ward's was 8·8%. The volume increases in retail sales of regular department stores did not reach their percentage of increases, since the sales of the department store group were only 7% larger in 1940 than in 1939.

The larger increases in the sales volume of the retail-mail-order companies were due in part to their opening additional retail units and in part to an improvement in economic conditions in rural communities covered by their mail-order activities.

Estimated total dollar sales in 1940 were only 6% below the 1929 volume, the highest year on record. For department stores, the number of transactions increased about 3% in 1940 over 1939 and about 16% in 1940 over 1929, the peak year.

The increase in sales volume for department stores in 1940 over 1939 enabled them to make only a slight reduction in their operating expenses because the increased physical volume handled necessitated additional personnel and the average wage levels were increased. Consequently, the percent of total pay roll expense to total sales in 1940 was about the same as in 1939.

At the close of the 1940 fiscal year, retailers had their inventories in a satisfactory position. Although the inventories averaged about 11% more in dollar value than they were at the close of 1939, this was not out of line with the expected increases in sales that are looked for in the early months of 1941 since it is expected that these increases will average at least 7½% during the first quarter of 1941.

The increase in the dollar value of inventories was due in part to some moderate increases in wholesale prices and in part to retailers' extending their commitments for a longer period where this was advisable to ensure deliveries of the merchandise.

Retailers were showing a commendable attitude in co-operating with the government in exerting every effort to hold down wholesale prices and not to speculate against impending price rises by making advance commitments. Instalment sales, or sales on deferred payment, showed an increase of approximately 12% in 1940 over 1939 since retailers have extended this plan of buying merchandise to additional lines of consumer goods.

Net profits on sales of department stores in 1940 generally will show an increase over 1939 before taxes are deducted.

The control of operating expenses in 1941 will still be a major problem for retailers in view of the higher prevailing wage levels, the tendency to shorter hours and the prospect of additional taxes. (*See* also CHAIN STORES; MAIL-ORDER BUSINESS; MARKETING.) (P. J. R.)

Réunion: *see* FRENCH COLONIAL EMPIRE.

Revenue Act of 1940: *see* LEGISLATION; NATIONAL INCOME; TAXATION.

Reynaud, Paul (1878–), French statesman, born at Barcelonnette, Basses-Alpes, Oct. 15. He was educated at a Paris lycée and received his doctorate in law from the University of Paris in 1904. He served throughout the World War of 1914–18 and received the Croix de Guerre. His political career began with his election in 1919 to the chamber of deputies from Basses-Alpes. He was minister of finance in the Tardieu cabinet (1930), minister of colonies in the Laval cabinet (1931–32), vice-president of the council and minister of justice in the Tardieu cabinet (1932) and minister of justice and minister of finance in the Daladier cabinet (1938–40). On March 21, 1940 he succeeded Daladier as premier. Less than two months later the German invasion began. On June 6 he reshuffled his cabinet and ousted Daladier as minister of foreign affairs. On June 10 he moved his government from Paris to Tours and on June 14 from Tours to Bordeaux. On June 16 he resigned and was succeeded by Pétain, whose lot it was to ask Germany for peace. Reynaud, along with other former officials, was taken into custody Sept. 7 to await trial at Riom on charges of contributing to the French defeat.

Reynolds, George McClelland (1865–1940), U.S. financier, was born in Panora, Ia., Jan. 15. He was educated in the public schools and at the age of 15 was employed by a bank in Panora. The Continental National bank of Chicago made him cashier in 1897 and in 1906 elected him as its president. Through various consolidations and mergers he built up the first billion dollar bank in the Middle West and the second largest in the U.S.A., under the name of the Continental Illinois National Bank and Trust company. He remained with it until 1933. In 1932 he was chairman of the National Credit corporation, formed to aid banks in distress before the creation of the Reconstruction Finance corporation. He died in Pasadena, Calif., Feb. 26.

Rheumatism: *see* ARTHRITIS.

Rhode Island, one of the original states of the United States, popularly known as "Little Rhody," is a north Atlantic state of the American union, belonging to the New England group; area, 1,248 sq.mi. (smallest of the United States); population according to the U.S. census of 1940 was 713,346. The

ethnic composition (1936 state census) was as follows: native white 77·2%, foreign-born white 21·3% (French Canadian 4·9%, Italian 4·4%, English 3·0%, Irish 2·0%, Polish 0·9%, Scotch 0·8%), Negro and other non-white 1·5%. The population increase between 1930 and 1940 was 25,849 or 3·8%, as compared with 13·7% between 1920 and 1930. The increase between 1930 and 1940 was the smallest in the state's history, excepting that during the period from 1790 to 1800 when the population was practically stationary. The population in 1940 represented a density of 674·2 per square mile of land area (1,058 sq.mi.).

The urban population in 1940 was 653,383 or 91·6%. The increase within urban areas from 1930 to 1940 was 2·8% as compared with 15·2% within the rural sections. This period showed a reverse in a trend toward greater concentration of population in urban areas, which lasted from 1830 to 1930.

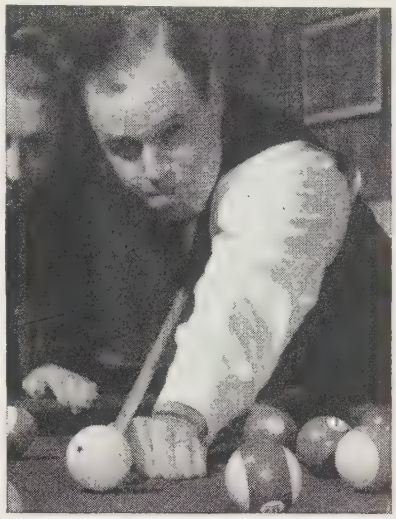
The cities are Providence (capital), population (1940), 253,504; Pawtucket, 75,797; Woonsocket, 49,303; Cranston, 47,085; Newport, 30,532; Warwick, 28,757; Central Falls, 25,248.

History.—At the regular 1940 session of the legislature leading measures passed were: act granting a new charter to city of Providence; act giving Providence a fifth seat and Pawtucket a second seat in the state senate and revising senatorial and representative district lines in Providence; act providing for a referendum on a nonpartisan system of municipal elections in Providence; act modifying the requirement for mandatory certification of cases to the supreme court from lower courts on constitutional questions; act placing a top limit of $3,000 on the amount of employee's salary on which an employer must pay unemployment compensation taxes; act establishing uniform aeronautics laws; act making appropriations for support of the state totalling $15,180,983.27 for fiscal year 1940–41; act appropriating $50,000 for use of the attorney-general's department in investigating election frauds; act granting $6,950 to pay the legislative committee on elections, frauds and corrupt practices and its clerks; acts allowing Providence to issue $1,000,000 in funding bonds and $750,000 in bonds for school improvements; act requiring cities and towns asking authority from the state legislature to issue bonds to provide specific information on their financial condition.

The chief officers of the state were: William H. Vanderbilt, governor; James O. McManus, lieutenant-governor; J. Hector Paquin, secretary of state; Louis V. Jackvony, attorney-general; Thomas P. Hazard, general treasurer; Edmund W. Flynn, chief justice of the supreme court. Elected at the November elections to the chief executive offices for 1941–42 were: J. Howard McGrath, governor; Louis W. Cappelli, lieutenant governor; Armand H. Cote, secretary of state; John H. Nolan, attorney-general; Russell H. Handy, general treasurer. In the 1940 presidential elections Roosevelt (Dem.) received 181,122 votes; Willkie (Rep.) 138,214; Browder (Com.) 239; Babson (Prohib.) 74.

Education.—During 1939–40 there were in the public elementary schools 65,841 pupils and 2,246 teachers; in junior high schools 24,443 pupils and 972 teachers; in senior high schools (three years) 17,967 pupils and 801 teachers and in senior high schools (four years and vocational) 5,947 pupils and 210 teachers. There were in private and parochial elementary schools 23,149 pupils; in junior high schools 4,742 pupils; in senior high schools (three years) 463 pupils and in senior high schools (four years) 5,706 pupils. Teachers in private and parochial schools numbered 1,222. During the school year 1938–39 per capita costs based on average membership and day school current expenditures were $95.30 for the state, ranging from $130.24 to $64.48 for the various towns and cities; per capita costs of public day schools for the state were $78.93, $101.70, $136.22 and $112.56 for elementary schools, junior high schools, senior high schools (three years) and four year high schools, respectively.

Charities and Correction.—In Nov. 1940 the state department of social welfare administered aid to the following classes and numbers of relief recipients: old-age assistance, 6,968 persons; aid to dependent children, 1,263 families (3,572 children); aid to the blind, 68 persons; state unemployment relief, 5,168 cases; soldiers' relief, 198 cases. The total number of persons receiving relief in all categories (including a small amount of overlapping among categories) was 32,435 or about 4·5% of the state's population. Under the same department these institutions reported for November, inmates: mental hospital, 2,774; infirmary, 817; school for feeble-minded, 771; home and school, 221; correctional school for girls, 36; correctional school for boys, 100; soldiers' home, 72; reformatory for men, 82; reformatory for women, 23; jail and prison, 402.



J. HOWARD McGRATH, Democrat, was elected governor of Rhode Island Nov. 5, 1940

The department also exercised guardianship over 1,378 child wards of the state.

Banking and Finance.—In the state there were 35 banking institutions. Resources of 23 banks under state supervision totalled $455,978,639.75 and of 12 banks under federal supervision, $125,514,639.22. Savings deposits in savings banks and trust companies amounted to $319,022,873, representing 404,695 depositors June 30, 1940. In addition, six loan and investment companies had resources of $9,139,878.47; eight building and loan associations, $39,402,013.44; 18 credit unions, $3,550,341.30.

Civil Service.—Of a total of 4,380 state employees, the number placed in classified service was 3,541, representing 525 distinct occupational classes. Starting off during 1940, under the new act requiring open competitive examinations for all positions, 76 examinations were completed and appointments made to 282 key positions. Also, at close of the year 18 examinations were in process covering approximately 550 additional positions.

Agriculture.—The farm population was 21,751 (1935). Land area in farms (1940), 221,913 ac.; 3,014 farms; value, $26,334,374. Crop production estimate (1940), by acres and quantity indicated: tame hay, 46,000 ac., 56,000 tons; alfalfa, 1,000 ac., 2,000 tons; potatoes, 4,500 ac., 878,000 bu.; corn, 10,000 ac., 369,000 bu.; apples, 267,000 bu.; peaches, 18,000 bu.; pears, 7,000 bu.; grapes, 280 tons. Livestock, 3,000 horses and colts; 24,000 dairy cows and 6,000 other cattle; 7,000 hogs; 2,000 sheep and lambs; 370,000 hens; 36,000 turkeys. Livestock products (1939), 145,000,000 lb. of milk; 3,666,000 dozen of eggs.

Industry and Business.—Rhode Island Unemployment Compensation board reports for 1939 total employment of 193,010, receiving wages of $235,678,585. Manufacturing employment, 122,881, receiving wages of $145,298,750. Contract construction employment, 7,179; mining and quarrying, 225; insurance, real estate and finance, 5,502; service, 14,113; transportation, 4,929; communication, 2,174; trade, 31,815; utilities, 3,350. The United States census of manufacturers for 1939 listed 1,460 establishments employing 106,275 workers, producing goods valued at $516,390,541 and paying in wages $105,406,950. (M. C. Mi.)

Rhodesia. The territory extending from the Transvaal border northward to the boundaries of the Belgian Congo and of Tanganyika Territory. It is bounded on the east by Portuguese East Africa, Nyasaland and the Tanganyika Territory, and on the west by Belgian Congo, Portuguese West Africa and Bechuanaland. Area 440,656 sq.mi.; comprises two territories of the British empire, viz., Southern Rhodesia and Northern Rhodesia. Southern Rhodesia is a self-governing member of the British commonwealth, but supervision over native rights is reserved to the imperial government. Northern Rhodesia remains a dependency of the crown. Certain essential statistics are given in the table below. (*See* also BRITISH EMPIRE.)

History.—*Southern Rhodesia.*—On Sept. 12, 1940 Southern Rhodesia celebrated the 50th anniversary of the beginning of British administration in the country. Having freely entered the war at Britain's side, it devoted all its energies to the common war effort. At the request of the United party ministry, enlarged to include two Labour members, the legislature voted the unprecedented sum of £5,300,000 for expenditure in 1940–41, of which £1,500,000 was earmarked for the war.

A war loan of £1,000,000 was also raised, and loan certificates issued and eagerly bought up.

Compulsory military service for Europeans between 18 and 55 was introduced in May; and the first two age-groups, covering the ages 18 to 40, had been called up by the end of June. A native unit, the Rhodesian African Rifles, was also raised by voluntary enlistment. A large number of Rhodesian troops were drafted to the theatres of war in Britain and the middle east in the course of the year. For air-fighting, Rhodesia undertook to contribute three squadrons to the royal air force. The first of these was sent to Kenya on the outbreak of war; the other two were established in Britain. A scheme, however, was adopted for training pilots from all parts of the empire in Rhodesia, similar to the greater empire scheme in Canada, but on a smaller scale. Work was begun on the training centres, of which there were to be seven, and aircraft and instructors were sent out from Britain. When the scheme is in full operation, 2,000 pilots will be trained each year.

Equally important was the economic contribution to the war. A government committee was appointed in July to examine and harness the country's resources for the manufacture of munitions and essential civil supplies.

Shipments of such vital materials as chrome ore, asbestos, tungsten and mica were dispatched to Britain. The British government also undertook to purchase the whole output of frozen meat and of gold, as well as large supplies of tobacco, maize and other foodstuffs.

Northern Rhodesia, a non-self-governing colony, is poorer in population and resources than her neighbour. Volunteer forces were raised, both European and African, and a detachment was sent by motor to Kenya. Public money was voted and private gifts made for war purposes; and the production of minerals needed in Britain—copper, lead, zinc, cobalt and vanadium—was speeded up. (R. Co.)

Rhodesia

Territory and Area in sq. mi.	Mineral Production in 1939 (value)	Imports and Exports 1938 (in thousand £)	Road and Rail 1938	Revenue and Expenditure (in thousand £)	Education: Elementary and Secondary 1938
NORTHERN RHODESIA 290,323	copper, blister, £7,977,565 copper, electrolytic, £1,466,806 cobalt, £1,482,149	imp. 5,224 exp. 10,135	All rds. 5,924 mi. rly. 622 mi.	(est. 1940) rev. 1,901 exp. 1,599	Eurpn. schls., 18, schlrs., 1,320; African schls., 431, schlrs., 35,570.
SOUTHERN RHODESIA 150,333	gold, £6,227,282 base metal, £1,895,741 All minerals (total) £8,137,682	imp. 9,759 exp. 10,574	Main rds. 1,621 mi. rly. 1,357 mi.	(est. 1940) rev. 4,900 exp. 5,322	Eurpn. schls., 111, schlrs., 10,762; Asiatic and coloured schls., 12, schlrs., 11,462; native (1937) schls., 1,283, schlrs., 108,995.

Ribbentrop, Joachim von (1893–), German statesman. The son of a former lieutenant colonel, descended from a family long connected with the German army, he was born April 30 at Wesel on the Rhine and was educated at the gymnasium at Metz. In 1910 he went to Canada as an independent merchant. At the outbreak of war in 1914 he returned to Germany, enlisted in a Hussar regiment, advanced to lieutenant colonel, and by the end of the war was attached to the war ministry. After the war he returned to private business as a wine merchant. He first became identified with the nazi party as a worker in 1930. At his home in Berlin-Dahlem were held the important meetings that preceded Hitler's appointment as chancellor of the reich, Jan. 30, 1933. In 1935 Ribbentrop was appointed ambassador-at-large, and from 1936 to 1938 he was ambassador to Great Britain. He became foreign minister Feb. 4, 1938 and played a prominent role in the diplomatic negotiations that preceded the war.

Ribbentrop was at Hitler's elbow during all the latter's more important conferences with representatives of other states in 1940. He was also charged with releasing the official German apologias for the invasions of the year and on April 27 exhibited what he declared to be incontrovertible evidence that Britain had planned the invasion of Norway. Among his other diplomatic duties of 1940 were the signing of the Axis-Japanese pact on Sept. 27 and the several pacts by which Hungary, Rumania and Slovakia adhered to the axis. On July 19 Hitler declared before the reichstag that "the name of von Ribbentrop as foreign minister will for all time be connected with the political rebirth of Germany."

Rice. Production of rice in the United States in 1940 was estimated by the department of agriculture Dec. 1 as 52,754,000 bu. compared to 53,722,000 bu. in 1939 and a ten-year (1929–38) average of 44,254,000 bu. The 1940 yield was reduced by heavy storms in August in Louisiana and Texas. Table I shows the estimated production by states in 1940 and 1939.

Table I.—*Rice Production by States, 1939 and 1940*

State	1940 bu.	1939 bu.	State	1940 bu.	1939 bu.
Louisiana . . .	18,040,000	21,120,000	Arkansas . . .	9,741,000	8,430,000
Texas	16,005,000	15,172,000	California . . .	8,986,000	9,000,000

The 1940 rice crop in China was estimated at 2,440,000,000 bu.; that of 1939 at 2,600,000,000 bu., and the five-year (1933–37) average at 2,454,000,000 bu. Spain, 11,758,000 bu. in 1940 as against 6,124,000 bu. in 1939 and a five-year (1932–36) average of 14,161,000 bu. The 1940 rice crop of Japan, 574,000,000 bu., was the smallest since 1935 and resulted in an acute rice shortage, with the government taking over distribution and limiting the supplies to hotels and restaurants in a number of cities. The government also authorized a subsidy of $2,747,000 in July to growers to encourage increased production, and riceless meals, days and weeks were advocated and ration cards put into effect in certain areas. Reduction in the supply of farm labour and of fertilizers contributed to the short crop of 1940 and also of 1939 when production was 627,000,000 bu. Japan imported more rice in 1940 than at any time in 15 years. The 1940 crop in Chosen was estimated at 196,000,000 bu., compared to 131,000,000 bu. in 1939. Preliminary 1940 estimates in the Philippine Islands were for a crop of 52,000,000 cavans of 97 lb. per cavan. Imports were

estimated at 400,000 to 500,000 bags. Rice exports from Burma Jan. 1, 1940 to August were estimated at 2,037,293 tons compared

Table II.—*U. S. Exports of Rice by Countries, 1939 and 1940*

	1940 lb.	1939 lb.		1940 lb.	1939 lb.
Cuba	239,514,000	239,449,000	Germany	..	180,000
Canada	15,159,000	19,006,000	Other European countries	12,067,000	5,909,000
United Kingdom	10,600,000	10,782,000	*Shipments from U. S. to possessions*		
Sweden	7,416,000	2,982,000			
Belgium	4,561,000	13,349,000			
Greece	3,243,000	12,580,000	Puerto Rico	263,409,000	211,284,000
Denmark	1,823,000	4,168,000	Hawaii	81,159,000	78,531,000
Netherlands	1,564,000	9,464,000	Alaska	971,000	1,102,000
France	541,000	78,000	Virgin Islands	563,000	1,382,000

with 2,550,142 tons in the same period in 1939. Table II shows rice exports from the United States for the years ending July 31 in 1940 and 1939 by countries of destination. (S. O. R.)

Richardson, James Otto (1878–), U.S. naval officer. He was born Sept. 18 at Paris, Tex. and was graduated from Annapolis in 1902. From 1924 to 1927 he was assistant chief of the naval bureau of ordnance and from 1928 to 1930 director of officer personnel. He was chief of staff for the commander-in-chief of the U.S. fleet in 1935–36, commander of destroyers in the scouting force in 1936–37, assistant to the chief of naval operations in 1937–38, chief of the navy's bureau of navigation in 1938–39 and commander of the fleet's battle force from 1939 until his appointment on Jan. 6, 1940 as commander-in-chief of the United States fleet. After his return from Hawaii in July he conferred at length with President Roosevelt on the navy's war games in the Pacific. In October he held a series of conferences with Secretary of Navy Knox, President Roosevelt and naval officials.

On Jan. 8, 1941 President Roosevelt announced that Richardson would be succeeded Feb. 1 as commander-in-chief of the fleet by Rear Admiral Husband E. Kimmel.

Riesman, David (1867–1940), U.S. specialist in internal medicine, was born in Saxe-Weimar, Germany, March 25. He went to the United States in his youth and after studying in the high school at Portsmouth, Ohio, he entered the medical school of the University of Pennsylvania, where he graduated in 1892. He taught pathology for eight years and became a full professor in the medical school in 1912. He served in the army medical corps during the World War of 1914–18. He was co-editor of *History of Medicine in the Middle Ages, The American Textbook of Pathology* and several other books. He was interested in the Italian Renaissance and was made a chevalier of the Order of the Crown of Italy, but returned the decoration as a protest against fascism. He served as president of the American Society of Medical History and several other medical organizations. At the time of his death in Philadelphia, June 3, he was engaged in arranging for the erection of a laboratory at the Philadelphia General hospital in memory of Dr. William Osler.

Rivers and Harbours. Improvements of rivers, harbours, and other waterways of the United States for navigation are prosecuted by the corps of engineers, U.S. army, under the direction of the secretary of war and the supervision of the chief of engineers, in accordance with plans authorized by the congress. Approximately 1,000 river and harbour projects were in force on June 30, 1940. New work was completed on 89 projects and materially advanced on 221 other projects. Active maintenance operations were under way at 307 localities. Total expenditures during the fiscal year were $113,200,000, of which $70,700,000 was for new work. The total net water-borne commerce during 1939 over federally improved waterways and harbours of the United States, after eliminating all known duplications, was 569,400,000 short tons.

The principal items of new work in progress during 1940 on rivers and harbours, exclusive of that on canals and inland waterways, included rock removal and dredging in New York and New Jersey channels to secure increased depth of 37 ft. in rock and 35 ft. in other material to provide more adequate navigation facilities in this intensively used waterway which extends through Lower New York bay, Raritan bay, Arthur Kill and Kill van Kull to deep water in Upper New York bay; dredging to deepen the Delaware river channel from Philadelphia to the sea to 40 ft.; dredging in Thames river, Conn., to provide a 25-ft. channel to Norwich; breakwater construction and dredging at Stamford harbour, Conn.; the deepening of James river, Va., to provide a depth of 18 ft. at Richmond; and channel improvement to provide 6-ft. navigation from the mouth of West Pearl river to Bogalusa, La.

Additional dikes for contraction works and dredging for channel correction were under way at southwest pass, Mississippi river mouth, together with further improvement of Calcasieu river and pass, La., Sabine-Neches waterway, Tex., Houston ship canal, Tex., and Port Aransas-Corpus Christi waterway, Tex. On the Great Lakes work was advanced at Sturgeon bay and Lake Michigan ship canal, Wis., Keewanee waterway, Mich., Erie harbour, Pa. and Buffalo harbour, N.Y. Dredging was continued at San Diego harbour, Calif., to provide the 36- and 26-ft. anchorages in Area M; and in San Joaquin river to provide the 30-ft. channel to Stockton. On the Columbia river, Vancouver to Bonneville, 32 dikes were completed and dredging was executed for the 27-ft. channel. Major works completed include a 40-ft. channel at Boston harbour; jetty construction and dredging at Barnegat City, N.J.; a turning basin of 35-ft. depth at Hollywood harbour, Fla.; contraction works and a channel, generally 30 ft. deep, at south pass, mouth of the Mississippi river; channel facilities at Brazos island harbour, Tex., including a channel 28 ft. deep to Point Isabel and Brownsville; harbour enlargement at Fairport and Ashtabula, O.; and an 18-ft. channel with protecting entrance jetties at Yaquina bay and harbour, Ore. (*See* also CANALS AND INLAND WATERWAYS; FLOODS AND FLOOD CONTROL; WATER POWER.) (J. L. S.)

Europe.—There is something almost ironical, and even fantastic, in discussing dock and harbour developments in Europe under the conditions existing in 1940. Not only was there a paralysis of all engineering enterprise in the direction of port extension and enlargement, but the most intensive military efforts were devoted to the demolition and destruction, by gunfire, and explosive and incendiary bombs, of the installations hitherto in existence. Along the entire coast of northwestern Europe, from the north of Norway to the south of France, there was a sorry scene of ruin and devastation: the quays of Hamburg, Bremen, Rotterdam, Dunkirk, Calais, Boulogne, Cherbourg and Bordeaux, to mention only a few of the many instances, once busy centres of maritime trade, were completely in ruins or deserted by mercantile shipping, while the transit sheds and warehouses, which customarily store valuable produce, were either burned down or blasted beyond possibility of service. Spain was the only western country on the continent where there remained a semblance of constructional operations and, in this case, it was merely a program of restoration following an experience similar to that undergone by her neighbours.

Great Britain did not escape her share of the general devastation, the port of London being a conspicuous example. Apart from this, all improvement schemes were necessarily suspended for the duration of the war, except in a few cases where works begun some

RADIO-CONTROLLED FLOATING LIGHTS perfected in 1940 are used to convert rivers, harbours and lakes into sea-dromes

time ago, as at London itself, Avonmouth and on the Tyne, had reached an advanced stage, so that it was considered desirable to continue them to completion. But progress was slow, on account of lack of materials and labour which were diverted to military defence measures.

In Rumania, a new harbour, the foundation stone for which was laid by King Carol in Aug. 1939, was in course of construction at the port of Tashaul in the Black sea. Though designed chiefly for naval purposes as Rumania's chief naval base, it would also be used for commercial shipping to relieve the pressure at Constanța. It was to have an area of 2,594 hectares (about 6,000 acres).

Africa.—In Egypt, a scheme, estimated to cost £3,000,000, for the improvement and enlargement of Alexandria harbour was laid before the chamber of deputies by the Egyptian minister of communications. The main items in the scheme were the deepening of the principal entrance to the harbour to a depth of 42 ft., the construction of a new petroleum basin and of new quayage, together with the building of a dry dock for large vessels. The work, the inception of which was delayed by the war, would be spread over a period of from five to ten years.

A new port was in course of formation at Nacala, in Portuguese East Africa, where there is a natural harbour with deep water anchorage. Surveys had been completed and piling operations were in progress. A railway was to be laid from Nacala to connect with the Mozambique-Nyasaland line. There was also steady progress at the port of Beira, where a new channel entrance to the port was being dredged to a width of 600 ft. and a depth of 18 ft. at L.W.O.S.T.

The important program of works for the enlargement of the harbour at Cape Town was pursued according to schedule. The new outer breakwater with a length of 7,000 ft. was completed and the new quay wall, designed to extend for a distance of 4,000 ft. from the south arm, was constructed for well over half its length. As the work progressed into deeper water, the rate of progress was necessarily slower. More than a moiety of the land reclamation in Table bay was effected, inclusive of the site for the new graving dock, 1,200 ft. long and 150 ft. wide.

At Durban, an important quay development scheme was in hand on the east side of the bay, comprising a T-shaped jetty with berthage adjacent for seven large ships and two other deep-water berths to the northwest. At the entrance of the harbour the cant of the north pier or breakwater was being removed to facilitate the movements of shipping.

Australia.—In Australia, a large new dry dock of outstanding dimensions (1,050 ft. long by 137 ft. wide at coping level with 45 ft. depth of water over sill) estimated to cost £3,000,000 was contemplated at the port of Sydney, New South Wales, and a site for the dock was fixed. (B. Cu.)

Roads and Highways.

Highways and highway transportation continued to be of importance in every country of the world in 1940. Those countries at peace spent large sums in modernizing existing highways and in extending highway systems. The notable progress of the past few years in extending highways through sparsely settled regions and into less known portions of the world was continued. In those countries drawn into the European conflict major highway improvement was almost entirely stopped. Censorship in the countries at war prevented disclosure of complete information on highway improvement and use. However, there was much evidence of the importance of highway transport to a nation at war and of adaptation of road maintenance and vehicle movement to war conditions.

Highways of the world, in 1940 totalled 9,800,000 mi., of which about one-third had been improved. The use to which they were put is indicated by the 45,422,000 motor vehicles in use on Jan. 1, 1940. There is one vehicle to every 47 people. The United States led with 31,009,000 vehicles, followed by the United Kingdom with 2,430,000, France with 2,398,000 and Germany with 1,959,000. Next in order came Canada, Australia, Soviet Union, Italy and Union of South Africa.

United States.—Of the 3,000,000 mi. of rural road in the United States, 1,300,000 in 1940 were surfaced. The greater portion of highway expenditures went into the modernization of roads built some years ago rather than for the construction of entirely new roads. The highway event attracting the widest public attention in 1940 was the completion and opening to traffic of the Pennsylvania turnpike. This 4-lane divided highway, 160 mi. in length, extends from near Harrisburg to the suburbs of Pittsburgh, Pennsylvania. It is operated as a toll road. Features of the highway that contrast noticeably with most other highways, are the separation of grades at all intersections with other highways, the continuous wide right-of-way permitting control of roadside development, the complete control over all access to the highway thus removing the hazards of minor entrances, the absence of utility poles and all other features not pertinent to the operation of the highway.

In almost every state notable highway projects were completed or under way. Examples were the extension of the Blue Ridge

parkway in Virginia and North Carolina, completion of the bridge across the Mississippi river at Baton Rouge, La., work on the Arroyo-Seco parkway between Los Angeles and Pasadena, and reconstruction of sections of the Bear Mountain highway in New York and the Pacific highway in Oregon and Washington. During the fiscal year ending June 30, 1940, federal-state co-operative highway construction resulted in the completion of 11,397 mi. In addition, 414 railroad-highway grade crossings were eliminated at a total cost of $296,932,000, of which $179,952,000 was federal funds.

On Nov. 7 the 2,800-ft. highway suspension span over Tacoma Narrows, near Tacoma, Washington, the third longest span ever built, was wrecked by a high wind. Failure occurred four months after the bridge was put in service. Careful studies to determine the exact cause were not completed at the close of 1940.

The Proposed Highway to Alaska.—The commission appointed by the president to investigate the feasibility of a highway to Alaska and to consult with Canadian officials made a report during the year. It found that the construction of a highway was feasible, that the building of 183 to 275 mi. in Alaska and 1,000 mi. in Canada would provide a route. Extension of the life of the commission, establishment of an office for the commission and surveys of alternate routes are recommended. No agreement with Canadian officials was reached by the end of 1940 and funds for surveys and construction were not authorized.

Proposed Pan-American Highway.—Three-fourths of the South American section of the proposed Pan-American highway was, in 1940, passable during all seasons. The 8,097 mi. of highway between the Colombia-Panama border and Buenos Aires, Argentina (alternate routes included) had improvements as follows: Paved, 2,015 mi. or 25%; all-weather surfaces, 4,147 mi. or 51%; dry weather surfaces, 1,646 mi. or 20% and trails, 289 mi. or 4%.

Progress was made on the section of the route between the United States and Panama. This section is 3,260 mi. in length and is improved as follows: Paved, 1,180 mi.; all-weather, 767 mi.; dry weather, 492 mi. and trails, 821 mi. Tourists from the United States in 1940 could travel a considerable distance south of Mexico City but it was not possible to reach the southern border of Mexico. Loans made by the United States to Costa Rica, Panama and Nicaragua totalling $8,800,000 will accelerate work on the highway during 1941. Steps were being taken to improve one of the most difficult sections on the entire route. The section is in southern Costa Rica through an almost uninhabited and little explored region of mountains and tropical jungle. Another difficult section, 300 mi. in length is between the Canal Zone and the Panama-Colombia boundary. Little progress was made toward a highway through this almost unexplored region of the Darien Indians.

Canada.—Much of the highway construction in Canada in 1940 was to serve the army camps and training areas of the air force. However, the war effort did not stop the expansion of the highway system that is so rapidly developing the country and attracting great numbers of tourists from the United States. The province of Quebec was embarking on a $60,000,000, 3-yr. highway program. The Trans-Canada highway from Halifax to Vancouver, linking nine provinces, was open to travel except for a 190-mi. gap in the region north of Lake Michigan. On this route 1,981 mi. were, in 1940, surfaced and 1,839 mi. were unsurfaced. Construction opened to the tourist 186 mi. of breathtaking beauty on the highway connecting Banff and Jasper National parks in the Canadian Rockies.

Europe.—At the beginning of the war, major highway improvements were being made or planned in almost every European country. Rigid censorship prevented disclosure of the details of what has been done since war began but there was strong evidence that highway work has been limited to immediate military needs. German authorities reported 2,100 mi. of the system of *Reichsautobahnen* completed on June 1, 1940, an increase of 200 mi. in the preceding 12 months. At the same time 1,300 mi. were reported under construction.

In England substantial grants were made by the ministry of transport to local authorities for improvement of trunk roads.

Experience in the countries at war and earlier experience in Spain indicated that heavy bombing attack may cause temporary difficulties in highway service but that it does not put highways out of use for any length of time. In the London area efficient organization of crews that repair gas, water, electric lines and highway surfaces made possible the operation of the great system of bus transportation without serious difficulty.

Wartime use of highways in England was characterized by rationing of gasoline, use of producer gas as a substitute for gasoline, immobilization of vehicles when not attended and removal of all road direction signs. Instructions were issued regarding stopping at raid shelters, what to do in a gas attack, and traffic movement in event of invasion.

Practically no highway work was done in France in 1940. Spain began the repair of highways damaged during its civil war. Greece reported 250 mi. of highway built in the year 1940. Italy resurfaced 900 mi. of road in Albania and completed 2,000 mi. of the road system in Ethiopia. One of the *autostrade* or special toll roads built in Italy was absorbed by the state because it was not self-supporting as a toll road. This was the third of the *autostrade* to be taken over. Four remained in private ownership. It is reported that one of these will be transferred to government administration. In Finland 2,000 men were at work building a highway to Petsamo which was being developed as a port. A projected railroad to this port was abandoned. Sweden continued the work of extending low- and medium-type highways to all parts of the country. It had in 1940 about 55,000 mi. of surfaced highway of which about 32,000 mi. were dustless surfaces. Toward the close of 1940 Sweden found it impossible to import bituminous materials for continuation of the work. The soviet union continued the building of low-type roads but did not report any extensive program.

THE $70,000,000 four-lane Pennsylvania turnpike was opened to traffic Oct. 1, 1940. The maximum grade of this 160-mi. superhighway through the Appalachians is 3%; there are no crossings, and cars can take all curves at 90 m.p.h.

Africa.—South Africa made good progress on the 5,000-mi. national system which was enlarged and extended. Highways now penetrate almost all parts of Africa. In 1939, 3,600 mi. were built in the Belgian Congo bringing the total to 4,700 mi. An English company operated fleets of buses in Kenya, Uganda and Mombasa in 1940. A 62,000-mi. road system extended across French possessions in Africa and 5,500 mi. of bus lines were in operation. Three main routes connected points that were much in the war news, Agadir, Casablanca, Oran, Dakar and Tunis.

Australia and New Zealand.—Normal road programs were continued. In Sept. 1940 work was begun on a 450-mi. highway in central Australia to link the terminus of the Central Australian railway with that of the North Australia railway and make possible north-and-south transcontinental communication. This work was projected as a defence measure to give access to Port Darwin which hitherto has been isolated during the rainy season. Working day and night with the most modern road machinery the road was completed late in November.

Asia.—The condition of highway improvement in Japan and recent progress were not disclosed by the Japanese government. In that portion of China occupied by Japanese forces there was deterioration of existing roads and practically no improvements were made.

Road building in west China in the past few years, to provide a network of communication links with the outside world, stood out as one of the greatest road-building efforts of modern times. More than 20 national trunk lines totalling 9,000 mi. and traversing Chinese controlled territory were open to traffic in 1940. Highways of all kinds in the area totalled nearly 50,000 mi. and 6,800 mi. were under construction.

No highway was in the world news in 1940 more than the Burma road extending from Lashio near the Burma border across Yunnan province and on to Chungking, the wartime national capital and centre of the Chinese network of highways. The 610-mi. Yunnan section was completed in 1939 and by March 1940 goods valued at $7,500,000 had been moved over it. It became a Chinese life line when all communication with the coast of China was stopped. British authorities stopped the movement of goods from Rangoon to the Burma road for a 3-months period beginning in July 1940.

After the reopening in October, large quantities of materials for Chinese armies were moved over it. Bombing attacks by the Japanese caused little damage. A hole blasted in the road could be repaired in a few hours and the larger bridges were not subjected to severe attack because of their remote location. Maintenance and repair of a large fleet of trucks operating over a great distance were more of a problem but this difficulty was being overcome.

The only contact of the Chinese with the outside world, other than over the Burma road, was through the "backdoor" overland route to the soviet union. Although twice the length of the Burma route, this road was much used for transport of military supplies. In Aug. 1940, while the Burma route was closed, the Chinese government placed 1,000 trucks in operation on a 700-mi. section of the route. Much work was done on this road in 1940. Winter snows, sometimes beginning in August, and distance from gasoline supplies are the greatest obstacles to transport over this highway. (*See* also TOWN AND CITY PLANNING.) (T. H. MACD.)

Robinson-Patman Act: *see* CHAIN STORES; LAW (CASE).

Rockefeller Foundation was chartered in 1913 for the permanent purpose of "promoting the well-being of mankind throughout the world." Its program is concerned with certain definite problems in the medical, natural, and social sciences, the humanities, and public health. In the field of medicine its interest is centred in nervous and mental diseases, and its contributions are chiefly for the furtherance of research and teaching in psychiatry and allied subjects. Its program in the natural sciences is concerned with experimental biology. In the social sciences it has three spheres of special interest: international relations, social security, and public administration. The program in the humanities centres around the techniques by which cultural levels of contemporary society are being influenced—such as museums, the radio, drama, and libraries—and the promotion of better international understanding through cultural interchanges. The program in public health includes research on a number of selected diseases; demonstrations in the control of some of these diseases in their environments; co-operation with governments in services of central or local health departments; and the development of public health education. During 1940 the Foundation appropriated approximately $9,800,000 for work in its various fields of interest. The chairman of the board of trustees was in 1940 Walter W. Stewart; the president, Raymond B. Fosdick; and the secretary, Norma S. Thompson.

General Education Board was incorporated by an act of congress in 1903, with the stated object of "promoting education within the United States of America without distinction of race, sex, or creed." Its program is restricted largely to the support of three types of work: (1) education in the southern states; (2) research and experimentation in relation to the problems presented in the field of general education; *i.e.*, the secondary school through the junior college level; (3) a program in child growth and development. In 1941 the board will terminate its work in the fields of general education and child growth and development. During 1940 appropriations approximating $6,500,000 were made by the board. The chairman of the board of trustees was in 1940 Ernest M. Hopkins; the president, Raymond B. Fosdick; and the secretary, William W. Brierley. (H. B. V. W.)

Rodman, Hugh (1859–1940), U.S. admiral, was born in Frankfort, Ky., Jan. 6, and was graduated from the United States Naval academy in 1880. He was promoted through various grades to rear admiral on May 23, 1917 and admiral on July 1, 1919. In the Spanish-American War he served on the "Raleigh," which fired the first shot in the battle of Manila bay. He was superintendent of transportation during the construction of the Panama canal in 1914–15 and served on the general board of the navy department in 1916–17. When the United States entered the World War in 1917 he went to sea as commander of a division of the Atlantic fleet. In April 1918 he was put in command of the entire U.S. battleship force in European waters. He retired on reaching the age limit in 1923, after receiving from the U.S. government the Distinguished Service and the Dewey medals. Great Britain made him a Knight Commander of the Order of the Bath, France made him a Commander of the Legion of Honour, Japan conferred on him the Order of the Rising Sun and Belgium gave him the Grand Cordon of Leopold II; he also received decorations from Peru and Chile. He represented the U.S. navy at the coronation of King George VI in 1937 and headed the line of foreign warships at the coronation review at Portsmouth. He died in Washington, June 7.

Rogers, Norman McLeod (1894–1940), Canadian statesman, was born in Amherst, Nova Scotia, July 25. He was educated at Acadia and Oxford universities, holding a Rhodes scholarship at Oxford. He served in the World War of 1914–18 with the Canadian Mounted Rifles. While acting as professor of history in Acadia university, he studied law and was admitted to the bar in 1924. He was professor of political science in Queens university from 1929 to 1935, when he was made minister of labour. When the cabinet was rearranged at the outbreak of the European war in 1939, he was made minister of national defence. He was killed in an aeroplane accident near Newtonville, Ont., June 10.

Roman Catholic Church. Though the residence of the pope and the offices of the Sacred Congregations, located in Vatican City state, are completely surrounded by Italian territory, Pope Pius XII maintained an absolute neutrality between the nations at war, continued to plead with all of them for peace and expressed concern for his spiritual children engaged in both sides in the conflict. However, the pope and cardinals directing the spiritual and material wel-

fare of the church maintained contact with the Vatican diplomatic representatives and delegates throughout the world and thus transacted normal, routine procedure.

Population.—An exact total of the number of Catholics in the world cannot be specified, but the latest available figures indicate that there are nearly 400,000,000. The largest percentage is found in continental Europe, the smallest in the missionary continents of Asia and Africa. In the English-speaking lands, the distribution is calculated as follows: the United States and territories, 21,403,136; Canada, 4,700,000; England and Wales, 2,410,000; Scotland, 615,000; Eire, 3,020,000; Australia and New Zealand, 1,693,725. In the Latin-American countries of Central and South America, the number is estimated at about 61,000,000.

Organization.—Full and plenary power over the spiritual welfare of all Catholics, wherever resident, resides in the pope, as the vicar of Christ on earth. Direction of the temporal welfare of the church, likewise, in all its phases, is held by him, solely. Closely associated with the pope, are the members of the College of Cardinals. The traditional number is 70; at the end of 1940, there were 55, since no vacancies were filled since 1938. Assisting him in the governance of the Universal Church are sacred congregations, with offices in the Vatican City state. By his appointment, and in conjunction with him, the bishops govern, in spiritual and temporal matters affecting the church, the dioceses assigned to them throughout the world.

In the Universal Church there were in 1940, 1,716 active ecclesiastical jurisdictions. These were classified as: patriarchates, 14; archbishoprics, 258; bishoprics, 940; apostolic vicariates, 306; apostolic prefectures, 128; abbacies and prelatures, 52; mission prelacies, 18. To these may be added 772 titular archbishoprics and bishoprics, that is, sees no longer having resident prelates.

In the United States there were, in 1940, 117 jurisdictions, governing which or connected with which there were 2 cardinal archbishops, 20 archbishops, 95 bishops and other prelates. The number of priests in the United States, including diocesan and religious, totalled 33,912. Parishes numbered 18,733.

England and Wales are divided into 4 archdioceses and 14 dioceses. Scotland has 2 archdioceses and 4 dioceses. Ireland is composed of 4 archdioceses and 25 dioceses. In Canada, there are 12 archdioceses and 36 dioceses and vicariates.

Roman Curia.—The government of the world-wide organization of the church reposes, under the pope, in the cardinals resident in Vatican City state. Ecclesiastical matters of a legislative and executive nature are handled by 12 sacred congregations, each of which is presided over by a cardinal. Matters of a judicial nature are decided by three tribunals, each, likewise, with cardinals as judges. Ordinary and extraordinary business of a spiritual and temporal nature is transacted by five so-called offices. The secretary of state, Cardinal Luigi Maglione, includes among his other functions the direction of Vatican foreign relations. The decisions of the congregations and tribunals and all Vatican documents are published in the official organ, *Acta Apostolicae Sedis.*

Among the acts of the congregation, the following are of popular interest. A new edition of the *Index of Prohibited Books* was issued. Placed on the Index during 1940 were all of the works (Italian) of Alfredo Oriani; Edmund Fleg, *L'enfant prophète Jésus;* Karl Pelz, *Der Christ als Christus.* The Sacred Roman Rota, marriage tribunal, heard 56 applications for a decree of nullity, forwarded from all parts of the world. Thirty-nine applications were rejected; 14 were granted and the marriage declared null; two dispensations were granted of marriage contracted but not consummated; one was held void because of procedure. Eugenic sterilization, either permanent or temporary, was forbidden. Killing by the state of mental or physical defectives, because they were a burden to the state or society, was condemned. Use of electric light or oils, other than olive oil or beeswax, was permitted for sanctuary lamps in times of emergency. Due to the war conditions, Mass was allowed to be said on the afternoon of Christmas Eve, and modifications were made as to the Eucharistic fast.

On May 2, Pope Pius XII formally canonized St. Mary Pelletier (1796–1868), foundress of the Sisters of the Good Shepherd, and St. Gemma Galgani (1878–1903), tertiary of the Passionist order. On May 12, Mother Rose Philippine Duchesne (1769–1852), buried in St. Louis, Mo., who introduced the Society of the Sacred Heart in the United States, was solemnly beatified. Other beatifications included Joachima de Vedruna de Mas (1783–1854), foundress of the Carmelites of Charity; Marie di Rosa (1813–1855), foundress of the Servants of Charity; Emilie de Rodat (1787–1852), foundress of the Sisters of the Holy Family; and Ignazio da Laconi (1701–1781), Capuchin friar. A decree for the introduction of the cause for beatification of Elizabeth Ann Seton (1774–1821), famous American foundress of the Sisters of Charity, was ratified.

The Church in the Nations.—The status of the Catholic Church in all Europe was most depressed. In Italy, the confidence of the people in the pope, as a spiritual leader, remained firm. Some anti-clerical and anti-papal attacks were made by extreme fascists. In Germany and former Austria, the concordat of 1933 was violated more flagrantly in 1940 than in previous years. Subtle suppression of the church, in innumerable ways, was the constant principle of the nazis, and the youth were persistently nazified. The direct threat, during 1940, was that of securing allegiance through all means, mostly evil, of young clerics to the nazi system. Two reports were declared false: that the German and Austrian bishops, after their meeting at Fulda, would eventually issue a pastoral favourable to the nazis; that diplomatic agreements were being reached between Germany and the Holy See.

In the countries occupied by Germany, the church suffered a kind of martyrdom. Broadcasting over the Vatican radio in Jan. 1940, and confirming his utterances later, Cardinal Augustus Hlond, primate of Poland, declared that Poland was enduring a "wave of unparalleled atrocities and cruelties." The paganization was systematically carried through by both the German and the soviet despoilers. Belgium, predominantly Catholic, Holland, about 50% Catholic, and Luxembourg, nearly 90% Catholic, suffered in church property and through nazi anti-religious propaganda. On May 11, Pope Pius pledged the moral support of the Holy See to those countries, condoling with their rulers on the nazi invasion. A speaker over the Vatican radio station declared that Catholics in Alsace-Lorraine, comprising three-fourths of the population, "are being tried in the fire of a cruel persecution." Adverse conditions were rapidly developing in the Balkans toward the end of 1940 through the spread of war. Catholic progress in Norway and Finland was effectually stopped through the restrictions put on missioners. Catholics in Lithuania, Latvia and Estonia, which had exchanged diplomatic representatives with the Holy See, were subjected to a campaign of the "godless" after the soviet conquest.

France, divided by the nazis, strove to maintain its normal religious life. Of some 15,000 priests mobilized in the French army as soldiers and officers, many were killed and others taken prisoner. The Vichy government, Sept. 3, repealed the anti-clerical laws of 1904. In Spain, the government renewed its allegiance to the Holy See. A building program included the restoration of 4,850 churches. A papal encyclical was addressed to Portugal on its eighth centenary as a nation. A concordat with

the Holy See was concluded on May 7, 1940. In England and the British commonwealth, in Ireland, in Switzerland, in Mexico and South America, as in the United States, the condition of the Catholic Church was normal and generally marked with progress. Though deprived of support from European sources, the far-flung missionary efforts of the church in China, Japan, India, the Pacific, Asia and Africa were blessed with fruitful results and brought an increasing number of converts. (*See* PIUS XII; VATICAN CITY STATE.) (F. X. T.)

Rome-Berlin-Tokyo Axis: *see* CHINESE-JAPANESE WAR; FASCISM; GERMANY; HUNGARY; ITALY; JAPAN.

Roosevelt, Franklin Delano

(1882–). (See *Encyclopædia Britannica*, vol. 19, p. 535, for an extended biography.)

On Jan. 3, 1940, in his annual message to congress, President Roosevelt emphasized the need for stronger national defence and urged the extension of the Trade Agreements act. Said the president, "The overwhelming majority of our fellow citizens do not abandon in the slightest their hope and expectation that the United States will not become involved in military participation in the war." In his budget message the following day, he proposed an expenditure of $8,424,000,000 for the fiscal year beginning July 1, 1940, with greatly increased appropriations for the armed forces. On Jan. 4, he appointed Attorney General Frank Murphy to the supreme court, and named Solicitor General Jackson as his successor. At the Jackson day dinner in Washington on Jan. 8, he declared that the "enormous task which the Democratic party has already performed in this generation has been to provide the energy and the confidence to steer government in the interest, and under the direction of those of our people who do not want to be selfish, and who do not want to be greedy."

On Jan. 16, in identical letters to the president of the senate and the speaker of the house, the president recommended legislation authorizing a loan to assist Finland to purchase agricultural surpluses and manufactured products, not including the implements of war, and on Jan. 19, in an address to the White House Conference on Children in a Democracy, he asserted that adequate national defence calls not only for munitions and implements of war, but also "for educated, healthy and happy citizens."

In an address of Feb. 8 commemorating the 30th anniversary of the Boy Scouts of America, the president declared that "a religious freedom is basic in Americanism." On Feb. 9 he revealed that Undersecretary of State Sumner Welles would shortly visit Italy, France, Germany and Great Britain to advise "the president and the secretary of state as to present conditions in Europe. . . . Mr. Welles will of course be authorized to make no proposals or commitments in the name of the government of the United States," he said. On Feb. 12 Mr. Roosevelt left Washington for Pensacola, Fla., where he boarded the cruiser "Tuscaloosa." After proceeding to the Panama canal, and spending a few days fishing in Pacific waters, he returned to the capital on March 2.

Following the invasion of Finland by the soviet armies, the president, in a statement given to newspaper men on March 13, declared that the people of Finland, "by their unexcelled valour, and strong resistance in the face of overwhelming armed forces, have won the moral right to live in everlasting peace and independence in the land they have so bravely defended." And on March 29, after the return of Undersecretary of State Welles to Washington, he said that the information obtained by him would be of great value when the time came for the establishment of a just and lasting peace in Europe.

On April 13, he sharply arraigned the "unlawful use of force" in the invasion of Denmark and Norway by the nazis. On April 18, Mr. Roosevelt went to Warm Springs, Ga., for a spring holiday of about ten days. While at Warm Springs, he broadcast an address to the Young Democratic Clubs of America in which he charged that "our opponents are trying to frighten the country by telling people that the present administration is deliberately trying to put this nation into war."

In a special message on May 16, the president asked congress for an appropriation of $1,182,000,000 for the army and navy, and 50,000 war planes. "The developments of the past few weeks have made it clear that the possibility of attack on vital American zones makes it essential that we have the physical and the ready ability to meet those attacks," he told congress. In a "fireside chat" from the White House on May 26, he urged a speeding up of the nation's rearmament effort, and on May 28 he appointed a national defence advisory commission of seven to co-ordinate the defence program. On June 10 he made his famous "stab in the back" address at the exercises of the University of Virginia and a few days later in a telegram to Premier Reynaud announced that the U.S. would not consider as "valid any attempts to infringe by force the independence and territorial integrity of France." On June 20 he named Frank Knox and Henry L. Stimson, Republicans, to be secretary of the navy and secretary of war, respectively. On July 2, he appointed Lieut. Col. Russell L. Maxwell as administrator of export control.

Though the president remained silent as to his third term intentions, his friends were active in his behalf. After the spring primaries, it was evident that only an unequivocal assertion that he would not accept the nomination, even if tendered him, could prevent his draft by the Democratic party as its 1940 candidate. On July 17, the president was renominated, on the first ballot, at the Democratic national convention at Chicago. Henry Agard Wallace, secretary of agriculture, was chosen as his running mate. Mr. Roosevelt accepted the nomination in a speech, broadcast to the convention from the White House on July 19.

In the campaign that followed, national defence and U.S. relationship to the European war took precedence over domestic issues. On July 10, the president had asked congress for a $4,800,000,000 additional program of defence expansion. The Republican candidate, Wendell L. Willkie, was in substantial agreement with the president on the need for rearmament, and increased material aid to Britain. During the late summer and early fall of 1940 the president made several trips, inspecting national defence activities. On Aug. 31, he appointed Frank C. Walker to succeed James A. Farley, who had resigned as postmaster general on Aug. 8. Harry Hopkins resigned as secretary of commerce on Aug. 28.

On Aug. 18 the president conferred at Washington with Prime Minister Mackenzie King of Canada, and four days later the appointment of a joint Canadian-American defence board was announced. On Aug. 31, under authority previously vested in him by congress, he called a large number of national guard units into the federal service. In a message to congress on Sept. 3, he revealed that 50 over-age American destroyers had been traded for naval and air bases in eight British North American possessions. "This is the most important action in the reinforcement of our national defence that has been taken since the Louisiana Purchase," the president told congress.

In a speech before the Teamsters union in Washington on Sept. 11, the president urged the retention of the new deal's social gains. And on Sept. 16, he fixed Oct. 16 as the day for the first registration on the Selective Service act. In a speech at the University of Pennsylvania on Sept. 20, he declared that, "No dictator in history has ever dared to run the gauntlet of a really free election." On registration day, Oct. 16, when approximately 16,400,000 men registered for selective service, Mr. Roosevelt, in a nation-wide broadcast, asserted that "we prepare to keep the

peace in this new world which free men have built for free men to live in."

On Oct. 18, the White House announced that the president, because of a "deliberate falsification of fact by the opposition" had decided to make five speeches between then and election day. In his speech of acceptance, he had told the Democratic convention that he would not have the time or the inclination to engage in purely "political debate" during the campaign. These speeches were made in Philadelphia, New York, Brooklyn, Boston and Cleveland.

On the evening of Nov. 4, the president made a radio address from his home at Hyde Park, where he voted the following day. On Nov. 5, the president was re-elected for a third term. On Dec. 2 he boarded the cruiser "Tuscaloosa" for an inspection trip of U.S. defences in the Caribbean area. On Dec. 17, the president announced a plan to lend armaments to Great Britain, and three days later named a four-man board, headed by William S. Knudsen, to speed up the defence program and aid to Britain.

The president spent Christmas day at a family gathering in Washington. During the closing days of December, he devoted most of his time to conferences with congressional leaders, and to work on his budget and annual messages. On Dec. 29, in an address broadcast from the White House, he expressed the belief that the "axis powers are not going to win this war," and announced his determination to make the United States the "arsenal of democracy." (*See* also UNITED STATES.) (O. McK.)

Rosenwald Fund, The Julius. The Rosenwald fund differs from other large U.S. foundations in that the trustees are not only permitted to spend capital as well as income at any time but are compelled to expend all its funds within 25 years of the death of its founder, that is, before Jan. 6, 1957. During the 23 years since its establishment in 1917 by Julius Rosenwald, this fund has expended approximately $16,000,000, being all of its income from year to year and about three-fourths of its principal fund. At the close of the past fiscal year, June 30, 1940, the assets of the fund (held chiefly in capital stock of Sears, Roebuck & Co. of Chicago) had a value of approximately $4,500,000.

The chief program of the fund during its early years was aid in the building of rural public schools for Negroes. The main programs at present are (1) improving the content and quality of rural education in both white and Negro schools in the south; (2) aid in building up four important centres of higher education for Negroes: Howard university in Washington, D.C., Atlanta university in Atlanta, Ga., Fisk university in Nashville, Tenn. and Dillard university in New Orleans, La.; (3) efforts in behalf of Negro health; and (4) a series of fellowships for Negroes and for white southerners. During the year 1939–40 the fund expended $527,000 upon these and related programs.

Rosny, Joseph Henry, joint pseudonym of the French novelist Séraphin Justin François Boëx, and his brother, Joseph Henri Honoré Boëx (1856–1940). The latter died Feb. 14. For their biography see *Encyclopædia Britannica,* vol. 19, p. 561.

Rostron, Sir Arthur Henry (1869–1940), English sea captain, was born in Bolton, England, May 14, and was educated at the Bolton high school and Her Majesty's School Ship "Conway." He served on sailing ships until 1895, when he was employed as fourth officer on one of the Cunard ships. He rose in rank until he was commodore of the Cunard fleet from 1928 to 1931. He was in command of the "Carpathia" in 1912 when that ship rescued many survivors of the "Titanic" disaster. The U.S. congress gave him a gold medal in recognition of his services at that time, and he was made a Chevalier of the Legion of Honour by France. He died in Chippenham, Eng., Nov. 4.

Rotary International. Between Jan. 1 and Dec. 31, 1940, membership in Rotary clubs in approximately 80 geographical divisions of the world grew from 209,000 to 212,671; the number of clubs increased from 5,030 to 5,057, despite the loss of clubs and members in many of the countries which were subjected to totalitarian domination. General officers for 1940–41 (term ending June 30, 1941) were: president, Armando de A. Pereira, São Paulo, Brazil; vice-presidents, Allison Ware, Chico, Calif., U.S.A.; T. A. Warren, Wolverhampton, England; Cesar D. Andrade, Guayaquil, Ecuador; secretary, Chesley R. Perry; treasurer, Rufus F. Chapin. The usual Rotary activities included in 1940 an international convention in Havana, Cuba, June 9 to 14 and the holding of institutes of understanding, world-wide participation in Rotary Observance week (Feb. 18–24), and activities for the alleviation of war suffering. Rotary International publishes *The Rotarian* in English and *Revista Rotaria* in Spanish. About 25 regional Rotary magazines are published in some 15 languages. (C. R. P.)

Rothermere, Harold Sidney Harmsworth, 1ST VISCOUNT (1868–1940) British publisher, was born in London, April 26, and died in Hamilton, Bermuda, Nov. 26. For a biographical sketch see *Encyclopædia Britannica,* vol. 19, p. 573.

Rowing. The 1940 intercollegiate rowing season opened in the U.S. on April 20 with three regattas. On Lake Washington the University of Washington defeated the University of California by two lengths in a hard fought race over the three-mile distance to win the Pacific coast championship. Washington also won the junior varsity race, but lost to the California freshman eight by half a length. On Lake Carnegie, Princeton won over the Naval academy by a margin of one and one-half lengths. In the junior varsity race, Navy crossed the finish line only a few feet ahead of Princeton. On the Harlem river, Columbia easily defeated Rutgers and Manhattan in three races.

Columbia won its second race of the year in an easy victory over three crews from the Navy, April 27, on the Severn river at Annapolis. Harvard opened its season with clear-cut victories over Syracuse, Massachusetts Institute of Technology and Boston university in varsity, junior varsity and freshman races. On the same day, Pennsylvania in its first race defeated Rutgers.

On May 4 the two remaining major rowing universities made their debut of the 1940 season. Yale defeated Columbia and Pennsylvania on the Harlem river in one of the hardest fought races of the year for the Blackwell cup. Columbia's junior varsity and freshman crews remained undefeated in close races. Cornell won over Navy in the varsity and freshman races, but lost to the Navy junior varsity at Annapolis. In the third regatta on this day the Harvard varsity and junior varsity defeated M.I.T. and Princeton on Lake Carnegie to win the Compton cup for the fourth successive year.

Yale won its second victory of the season on the following Saturday at Derby in another tight, hard fought race. M.I.T. was nosed out in the final quarter mile, with Syracuse, the third entry, only a length behind M.I.T. The Yale junior varsity boat won and M.I.T. showed marked superiority in the freshman race. The Columbia crews finished their sprint season with a clean sweep in the Childs cup race on the Schuykill river, May 11. In the varsity race Columbia won over Pennsylvania by a length

and Princeton by two lengths.

Harvard won the Adams cup for the third consecutive year on May 18 at Philadelphia. An improved Pennsylvania crew placed second, a length behind Harvard and a length in front of Navy. The Pennsylvania junior varsity won its first major race of the year by defeating Navy by one second, with the Harvard junior varsity in third place. Harvard's fine freshmen remained undefeated by an easy victory over the Navy plebes and the Pennsylvania freshmen. This same Saturday saw Cornell, Yale and Princeton fighting over the two-mile course on the Housatonic river at Derby for supremacy in the Carnegie cup regatta. Cornell, content to stay in third place for most of the race, drove over the finish line to defeat Yale by a fifth of a second. Cornell established a new course record of 9:33$\frac{2}{5}$.

May 25 brought the only two undefeated crews in the east together. Rowing in a driving rain over the two-mile course on Lake Cayuga, a great Cornell crew defeated Harvard by a length and a half to win the sprint championship of the east. Syracuse, a crew that had been handicapped in its earlier races due to an unusually bad spring, finished only a few feet behind Harvard. In their last race of the year, Pennsylvania defeated the University of Wisconsin and Marietta college in the Allegheny regatta at Pittsburgh. The Poughkeepsie regatta, June 18, held an unusual amount of interest. Eight varsity crews (Princeton entering the race for the first time in its history) formed the largest field in several years. Washington, the Pacific coast champions, and Cornell, the only undefeated crew in eastern waters, were pre-race favourites for the four-mile Hudson river race. Washington lived up to its past record and won on a stormy windswept river that had almost caused postponement of the race. Cornell remained the best crew in the east by finishing only a length behind Washington.

The college rowing season was brought to a close by the 78th annual four-mile Yale-Harvard regatta on the Thames river, June 21. Starting at the railroad bridge at New London, a veteran and smooth-rowing Harvard eight faced a lighter, inexperienced Yale crew. Yale jumped to a slight lead in the first quarter mile. Rowing at a lower stroke, Harvard soon forged to the front and at each mile flag had increased its lead until it crossed the finish line at Bartlett's Cove seven lengths ahead of Yale. Harvard made a clean sweep of the regatta, having won the freshman and junior varsity races in the morning. The Harvard victory brought the score exactly even in this old series, 39 races apiece. Rutgers won over a field of nine entrants in the second Dad Vail regatta, May 18, on the Connecticut river at Springfield, Mass. Harvard won the annual Joseph Wright cup race at Boston for the championship in the lightweight division of college rowing for the second consecutive year. (E. O. Le.)

Ruanda and Urundi: *see* Belgian Colonial Empire; Mandates.

Rubber, Synthetic: *see* Chemistry; Standards, National Bureau of.

Rubber and Rubber Manufacture.

By far the most important development in 1940 was the expanded use of synthetic rubbers. The consumption of neoprene increased and new varieties of synthetics were developed. Ameripol, butyl rubber and Chemigum, introduced during 1940, were all new products of U.S. origin useful either for replacing for special purposes Perbunan (no longer available), or, should imports of crude rubber be interrupted, for general use in place of the natural product. Though considerably above the market price of crude rubber, the cost of synthetics should with large scale production approach these market levels. Certain esters such as are used for plasticizing synthetic resins were found useful also for modifying the properties of synthetic rubber compositions. As softeners for rubber the use of products made by polymerization of cashew-nut shell liquor greatly increased. The development of electrically conducting articles promoted the use in rubber compositions of carbon black produced from acetylene. Two new finely divided precipitated pigments appeared on the market—one a calcium silicate, one a calcium carbonate. In the processing field, a new system of handling batches of rubber compositions from Banbury mixers was extensively adopted. Instead of dividing the batches into three parts for separate sheeting, blending and cutting by hand, the new process automatically cuts and blends the stock, transfers it from mill to mill, forms and dusts slabs and places them on a cooling conveyor. Handling costs are thus greatly reduced. Another process was developed for automatically cutting plasticated rubber into coarse pellets, dusting them and conveying them by air to storage bins from which they are discharged by gravity at the weighing tables. This process facilitates handling at lower cost.

The government's program for national defence required the development of numerous new products. Means were devised for protecting gasoline and oil tanks and tires both on aeroplanes and road vehicles against leakage after puncture by projectiles. Rubber structures, reinforced by metal cables and crossplates embedded in the rubber were adopted for many military vehicles in place of jointed metal bands for tractor-type drives. The rubber tracks are lighter, wear less rapidly, require no lubrication and may be operated at considerably higher speed. Among tire developments were the production and sale of tires made with Ameripol; the development of oil-resistant industrial tires for use where contact with lubricants is unavoidable; change in design whereby, in order to increase stability and improve traction, the ratio of rim width to cross-sectional width of tires was increased; the use of cushion tires instead of pneumatics on the small tail landing wheels of aeroplanes; design of white-side tires was changed to apply white on one side only, to be mounted on the outer side of the wheel; as a result of the trend in automobile design the proportion of tires manufactured with small rim diameters increased. Synthetics made possible the development of flexible, electrically conducting gasoline hose nozzles, hose for handling butane and propane and covers of belts for conveying oil-treated coal. Rubber pads for the Guerin process of forming sheet metal, especially aeroplane parts, greatly reduced the cost of dies, the deformability of rubber making it suitable for use with dies of different sizes and shapes. Improvement in the method of attaching rubber printing plates in the presses reduced the cost of ink used in printing a "best seller" by 25% and the "make ready" cost preparatory to printing by two-thirds. The development of a new type of printing ink which is melted on the feed rolls and sets by chilling instead of by oxidation required the use of synthetic rubber rollers which would maintain the necessary degree of hardness at elevated temperatures. A method was devised for covering rollers for paper manufacture by attaching the rubber to a metal sleeve to be slipped over the roll core instead of adhering it to the core directly. This avoided the necessity of shipping heavy roll cores to the rubber manufacturer and saved in time required for replacement.

The use of plasticized polyvinyl chloride for electrical insulation increased greatly and wrist watch straps, suspenders, belts, garters and dog collars were made of this material in a variety of colours. (J. W. Sc.)

Rubber Footwear: *see* Shoe Industry: *Rubber Footwear.*

Rugby: *see* Football: *Great Britain.*

Rulers: *see* Sovereigns, Presidents and Rulers.

Rumania, a kingdom in southeastern Europe, had on Jan. 1, 1940 an area of 113,919 sq.mi. and a population of 19,900,000. During the year 1940 Rumania lost large parts of its territory to the soviet union, to Hungary and to Bulgaria. On June 27 the soviet union occupied the former Russian province of Bessarabia and the former Austrian province of northern Bukovina, territories with about 4,000,000 inhabitants and containing Rumania's second and third largest cities, Kishinev with 113,000 and Cernauti with 110,000 inhabitants. On Aug. 30 Rumania was forced by the Vienna dictate of Germany and Italy to cede northern Transylvania with 2,370,000 inhabitants to Hungary, and the treaty of Craiova of Sept. 7 gave the former Bulgarian province of southern Dobruja, with a population of 350,000, back to Bulgaria. This dismemberment of Rumania was the consequence of events connected with the general European situation and was accompanied by violent changes in the internal structure of the Rumanian state.

Rumania's internal order had been shaken by the emergence of the Rumanian fascist party, the Legion of the Archangel Michael, which had been founded in 1927 in Jassy by Corneliu Zelea Codreanu. This party, claiming to work for the racial and religious regeneration of Rumania on a national and Greek Orthodox basis, was violently anti-democratic and anti-Semitic and demanded a close co-operation with national socialist Germany and fascist Italy. Its political section, the Iron Guard, not only succeeded in gaining a large number of adherents among the youth, especially in the universities, in the officers' class and in the clergy, but also arranged a number of political assassinations of leading Rumanian personalities, among them Prime Minister Armand Calinescu. Against these excesses and anarchistic tendencies King Carol II tried to establish order by imprisonment and mass executions of Iron Guard leaders, Codreanu among them, and by a royal dictatorship which sought to protect the independence of the country by a policy of strict neutrality. The German-Russian treaty of Aug. 1939, the growing successes of national socialist Germany in the European war, and as a consequence the increasing audacity of the Rumanian fascists, put King Carol's regime into a very precarious position, so that on Sept. 6 he was forced to abdicate and leave the country, and his son Michael was proclaimed king. The real power passed into the hands of the Iron Guard, and Rumania changed from a royal dictatorship into an outright fascist state, which at the same time came entirely under German overlordship, was occupied by German troops and thus placed in the position of a German protectorate.

At the beginning of 1940 Rumania, whose independence and integrity had been guaranteed in April 1939 by Great Britain and France, played off the two opposing groups in Europe one against the other. Germany, whose strategic position along the Danube rendered it especially dangerous to the independence of Rumania, was most eager to receive a practical monopoly over Rumania's foreign trade, especially over Rumania's exports of oil and wheat; on the other hand, Rumania looked for the protection of her independence to Great Britain and to Turkey, Britain's ally, and therefore had to satisfy as far as possible British economic demands, especially in view of the fact that the Rumanian oil fields belonged largely to British, French and American companies and that Rumania wished to receive for her exports foreign currency, which she could not get from Germany, who restricted all her transactions purely to barter.

At the last opening of the parliament on March 7 King Carol in the speech from the throne stressed Rumania's will to maintain a strict neutrality and discussed the steps taken by the country in order to put itself on a war basis, so as to be able to protect this neutrality. But the king was soon forced to proclaim an amnesty for many of the Iron Guard leaders, while the successor

MAP showing territories ceded by Rumania to the U.S.S.R. (Bessarabia and northern Bukovina), Hungary (northern Transylvania) and Bulgaria (southern Dobruja) in 1940

of Codreanu, Horia Sima, returned from exile in Germany and resumed the leadership of the party. The Rumanian prime minister, George Tatarescu, expressed the hope that, in view of the external danger threatening the existence of the state and the national heritage, all parties would unite in a common defence of the fatherland. This hope proved to be in vain. The fascist party continued its destructive work, the final result of which was the dismemberment of Rumania and its complete subjection to Germany. Under increased German pressure and with the mounting tide of German successes on the western front, Foreign Minister Grigore Gafencu resigned on June 1 and was replaced by Ion Gigurtu, an adherent of a complete pro-axis orientation. On June 21 King Carol made an attempt to reorganize his government along strictly fascist lines, but his efforts were interrupted by the ultimatum from the soviet union which demanded the cession of Bessarabia and northern Bukovina. Under German pressure the Rumanian government complied with the demand, and on July 1 it renounced the guarantee received from Great Britain and France in 1939. The German air force occupied the country under the pretext of protecting the oil fields against a British attack. On July 4 Ion Gigurtu became prime minister and Horia Sima, the leader of the Iron Guard, became minister of education and enlightenment. British engineers and oil experts were ordered to leave the country immediately; the largest oil company was taken over by the Rumanian government, which established a monopoly over the exploitation of the oil fields and the export of the oil.

Negotiations with Hungary about Hungary's claim to Transylvania lasted for several weeks and created much bitterness between the two countries. Hungary claimed the largest part of Transylvania, which until 1918 had formed part of Hungary, but was predominantly inhabited by Rumanians and was regarded by them as the most progressive and nationally conscious part. Finally the German and Italian governments decided the dispute in a way which satisfied Hungary, but left the Rumanian population bitterly hostile. The award of Vienna did not try to find an ethnographic frontier in Transylvania, nor to do justice to linguistic or historical considerations; it was dictated entirely by the strategic and political interests of the axis powers. Much less antagonism was caused by the cession of southern Dobruja to Bulgaria. This quadrilateral plain between the lower Danube and

the Black sea had formed part of Bulgaria until 1913 and was inhabited by a Bulgarian majority. In view of the dismemberment of Rumania, Germany guaranteed the frontiers of the state as they emerged after the three territorial cessions. Under this pretext German troops occupied the country. The number of German soldiers was put at the end of 1940 as high as 600,000 men by some sources.

The ensuing unrest and the violent dissatisfaction which the cession of northern Transylvania provoked forced the king to name General Ion Antonescu dictator, a man who leaned upon the Iron Guard for the establishment of his government. This move did not, however, insure orderly administration. King Carol was forced to abdicate and left the country for Spain. His son and successor was king only in name; the real power was in the hands of Antonescu and the Iron Guard, which proceeded to avenge the execution of its former leaders. A large number of prominent Rumanian statesmen, former ministers, generals and high police officers were arrested. An earthquake on Nov. 10, which caused considerable damage, though the exact extent was withheld from the public by censorship, aggravated the situation. On Nov. 23 Rumania signed in Vienna its official adhesion to the Berlin-Rome-Tokyo pact. On Nov. 27 the Iron Guard started a week of massacre and terrorization throughout the country. Sixty-four of the arrested dignitaries were executed over the graves of Codreanu and 13 other Iron Guard leaders who were now exhumed and buried a few days later with the greatest pomp. Among the numerous victims of the widespread disorders was the leading historian and scholar of international repute, Professor Nicolas Jorga. Though General Antonescu succeeded in restoring order, internal strife continued for the rest of the year. (*See* also BALKAN ENTENTE; EUROPEAN WAR.) (H. KO.)

Rundstedt, Rudolf Gerd von (1875–), German soldier, was born Dec. 12 at Aschersleben, descendant of a noble family of Brandenburg. He entered the officers' training school at the early age of 12, received his commission, pursued further military studies at the academy of war and joined the general staff in 1907. At the start of war in 1914 he commanded a company in Alsace, then after a period of service with the general staff saw action on the eastern front in Galicia and northern Poland. It was in the latter regions that he acquired military fame in 1939 during the Polish campaign. His troops first stormed the Jablonica pass, then marched far into Galicia. He was in command at the fall of Cracow, Lodz and Przemysl. The battles of the river San and the bend of the Vistula, and the entry into Warsaw were further milestones in Gen. Rundstedt's career. For these accomplishments and for his successes during the invasion of the Low Countries and France in 1940 he was created marshal of the reich July 19, 1940.

Running: *see* TRACK AND FIELD SPORTS.

Rural Electrification. The accelerated pace in rural electrification in the United States, which received its impetus in 1935 with the establishment of the Rural Electrification administration, continued during the year 1940, the estimated number of farms with central station service approaching 2,100,000 in comparison with 1,700,000 at the end of 1939. In terms of the percentage of farms with electricity, the progress in 1940 was the greatest in the development of rural electrification, the percentage increasing from 25 in 1939 to an estimated 30 at the end of 1940.

The approximate number and percentage of electrified farms at the end of previous years were as follows: 1934, 744,000 farms, 10·9%; 1935, 789,000 farms, 11·6%; 1936, 1,043,000 farms, 15·4%; 1937, 1,242,000 farms, 18·2%; 1938, 1,407,000 farms, 20·5%. Prior to 1935 substantially all electrified farms received power from private utility companies; after 1935, rural electric service was furnished by both private companies and co-operative, non-profit enterprises. Over 99% of the federal rural electrification loans was made to the latter type of enterprise, essentially a community owned and operated business.

In response to the demands of rural communities for electric service during fiscal 1940 congress increased its authorization for rural electrification loans during fiscal 1941 from $40,000,000 to $100,000,000. By Dec. 31, 1940 Rural Electrification administration had allotted a total of $351,454,621 to finance on a self-liquidating basis the construction of rural electric systems comprising about 338,000 mi. of line to serve more than 1,119,000 rural consumers. At the close of the year 1940 approximately 270,000 mi. of these systems were in operation serving some 675,000 consumers in contrast to 181,000 mi. serving 435,000 consumers at the end of 1939. About 80% of these were farms, the balance consisting of schools, churches, commercial establishments and many types of rural industries.

As a result of the war in Europe and the national defence program of the United States, rural electrification was assuming, perhaps unexpectedly, an important new role in furnishing power for decentralized defence industries and military establishments. A study by the National Defense commission revealed that in both England and Germany quantities of war matériel were being produced in small rural workshops and shipped to assembly points. In the United States rural electric systems were serving army camps, aeroplane beacons, communication systems and many small industrial plants whose facilities were becoming increasingly important to the national defence program. During 1940 several rural electric co-operatives obtained mobile generating plants which were mounted on trailers and might be used to provide emergency service to essential defence industries or for military purposes.

In addition to wider availability of electric power in rural areas in 1940, farm consumption of power in the United States continued to increase and there was some further reduction in rates. Wider application of electric power to farm operations received an increasing amount of attention from agricultural colleges and research agencies of the department of agriculture. An appliance survey made by REA-financed systems during the spring of 1940 showed the percentage of relatively new farm consumers of electricity who acquired various appliances and equipment, among which were: radios, 87·5%; irons, 84·1%; washing machines, 55·3%; refrigerators, 31·6%; water pumps, 15·3%; fractional horse-power motors, 14·5%; and poultry lights, 10·5%.

In order to serve areas of low income and low density on an economical basis, a limited number of self-help projects were financed by the Rural Electrification administration during 1940. Under the self-help plan the farmer members of the co-operative performed the common labour required in constructing the system; such as digging pole holes, clearing right of way and trimming trees, for which they received credits. These were applied against the cost of wiring their houses or the purchase of appliances and equipment. Group purchase plans for obtaining electrical appliances and equipment at quantity discounts were developed and used more extensively by farm members of rural electric co-operatives during 1940.

Great Britain.—Information concerning rural electrification developments in England was in 1940 dependent on technical journals because publication of statistics was temporarily suspended by the electricity commissioners. Wartime conditions

SEVERAL HUNDRED THOUSAND U.S. farm people attended the Rural Electrification administration's travelling "Farm Equipment Show" in 1940

were the dominating influence on rural electrification developments in England during 1940, according to British technical journals. An article in the *Electrical Review* (London) for Aug. 1940, for example, reported "home food production is very much in the news at the moment, and the nation may well thank those electricity supply authorities which, by their enterprise in providing supplies to sparsely populated and barely remunerative rural areas, are now making it possible for farmers to employ electrical methods to aid food production and storage." Because of the labour shortage in rural areas, electric power was of increasing importance to farmers in carrying on their increased responsibilities with a minimum of labour. The single-strand electric fence was used extensively during the year to overcome the obstacle to the plowing up of grasslands created by a shortage of timber for fencing. There was also a reported increase in the use of crop dryers for threshed corn, grass and clover.

Difficulties in obtaining materials somewhat retarded rural extensions during the year, it being reported by the *Electrician* (London) that electricity was giving 100% service on well over 40,000 farms but that there were some 160,000 additional farms justifying an intensified use of electric power. In order to encourage the development of rural areas and overcome the adverse influences of cost contributions to line extensions, the president of the Institution of Electrical Engineers in Oct. 1940 proposed that the general availability of electric power should be made compulsory within a limited time. While the war did not materially alter the domestic use of electricity during the year, there was a reported shortage of materials which resulted in a restricted production and supply of electric appliances. (R. B. C.)

Rural Electrification Administration (REA): *see* RURAL ELECTRIFICATION.

Russell Sage Foundation. The Russell Sage Foundation was created by Mrs. Russell Sage in 1907 as a memorial to her husband. Its purpose is "the improvement of social and living conditions in the United States of America."

The original gift by Mrs. Sage was $10,000,000, to which she added $5,000,000 in her will. The income of the Foundation in 1940 was approximately $570,000.

Among its more recent publications are: *Civil Service in Public Welfare* by Alice Campbell Klein; *The English Hire-Purchase Act* (1938) by John E. Hamm; and *Migration and Social Welfare* by Philip E. Ryan. (S. M. HA.)

Russia: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Russian S.F.S.R.: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Ruthenia, or Carpathian Ukraine, was formerly the easternmost part of the Czechoslovak republic. For a brief time in 1938 and 1939 Ruthenia entered the full limelight of history because the national socialist government tried to make it a spearhead for the penetration of national socialist propaganda into the soviet Ukraine and into Polish Ukraine. During that time an active Ukrainian nationalist movement was promoted in Ruthenia to become the rallying point for the creation of a great Ukraine which would unite all the 45,000,000 Ukrainians then divided among the soviet union, Poland, Rumania and Czechoslovakia. This plan was ended when in March 1939 Hungary occupied Ruthenia. At that time the occupation created a common Polish-Hungarian frontier, which was regarded by some as a possible check to German expansion eastward, especially in view of the fact that the Polish and Hungarian governments were connected by close and long-lasting ties of friendship. The conquest of Poland by Germany not only put an end to these plans but created a common frontier of Hungary and the soviet union. With the annexation of eastern Poland in Sept. 1939, and of northern Bukovina in June 1940, the soviet union comprised within its territory all the Ukrainians with the exception of approximately 500,000 in Ruthenia. There were repeated rumours that the soviet union would also try to incorporate Ruthenia, but such a move would be strenuously resisted not only by Hungary but also by Germany, which did not wish soviet troops to cross the Carpathian mountains. In view of that situation the Hungarian government in 1940 curtailed the small measure of autonomy granted to Ruthenia and proceeded to Magyarize the territory, thus hoping to put an end to the Ruthenian question. (H. KO.)

Rye. Production of rye in the U.S. in 1940 was but slightly above pre-drought averages owing to a decrease in acreage. The 1940 crop was estimated Dec. 1 by the department of agriculture as 40,601,000 bu. compared with 39,049,000 bu. in 1939 and a ten-year (1929–38) average of 38,095,000 bu. Yield per acre in 1940 was 12·7 bu. In 1939 the acre yield was 10·2 bu. and for the ten-year average it was 11·4 bu. The 1940 rye crop in Canada was officially estimated at 14,593,000 bu. from 1,035,000 ac., compared with 15,307,000 bu. from

1,102,000 ac. in 1939. The five-year (1933–37) average production in Canada was 10,988,000 bu., with the average acreage sown to rye as 701,000 acres. Rye is classed among the feed grains in North America and is not a large crop. In Europe where it is grown much more extensively, especially in Germany and Poland, it takes a more important part among the bread grains. Owing to wartime restrictions on agricultural statistics in many countries, data from principal rye-producing countries were not available. The 1940 crop in Sweden was reported as 11,653,000 bu. compared with 14,893,000 bu. in 1939. A short crop was also reported in Yugoslavia, about 9,800,000 bu. of rye and maslin, of which approximately 9,000,000 bu. was rye. Rye seeded in the United States in the autumn of 1940, for harvest in 1941, was estimated at 6,002,000 ac. (*See* also CEREALS.) (S. O. R.)

Sabry Pasha, Hassan (1879–1940), premier of Egypt and one of its most distinguished statesmen. He was minister to London in 1934 and 1935, having served previously as minister of finance. In 1936 he entered the cabinet as minister of communications, commerce and industry. He was minister of war in 1939, but resigned in protest against the reduction of the pay of officers. On June 27, 1940, he became premier, but resigned on Aug. 27. The king, however, persuaded him to continue in office. Sabry died in the Egyptian parliament at Cairo, Nov. 14, while reading King Farouk's message from the throne.

"Safety Zone": *see* BRAZIL; HISPANIC AMERICA AND THE EUROPEAN WAR; INTERNATIONAL LAW; NEUTRALITY.
St. Christopher: *see* WEST INDIES, BRITISH.
St. Helena and Ascension Island: *see* BRITISH WEST AFRICA.
St. Kitts-Nevis: *see* WEST INDIES, BRITISH.
St. Lawrence River Project: *see* PUBLIC UTILITIES.

St. Louis, largest city in Missouri and eighth largest in the United States, had in 1940 a population of 816,048. This figure, a 0·7% decrease in comparison with the 1930 census, is not indicative of a lack of growth, but of a population shift to suburban areas. This is evidenced by a new high, 1,087,066, in the combined population of the city and contiguous St. Louis county, an increase of 5·2% in a decade.

By the end of 1940, St. Louis appeared to have won a 50-year fight against one of its most formidable problems, the smoke nuisance. Chiefly responsible was a drastic ordinance which, with other strong regulations, prohibited use of coal having less than 23% volatile matter in any except mechanical fuel burning equipment. The effect was to reduce the use of cheap, smoky coal.

The historic levee district, a blighted area which has been turned into the site of a national park memorializing Thomas Jefferson and the westward pioneer expansion, was four-fifths razed by the close of 1940 and the federal government had granted $1,015,460 to landscape and beautify the 40-block area.

Work was begun on the city's first two federal housing projects which will cost $7,000,000 and accommodate 1,400 families. Public building by the city was confined largely to hospital improvements, on which $2,000,000 was spent. Private building again showed an increase in 1940. It approximated $13,700,000, an increase of 22%.

The financial condition of the city, always sound, improved in 1940. The municipal deficit stood at $1,682,729, after a $1,649,851 reduction in 12 months, was expected to be further lowered or even wiped out in 1941. Outstanding indebtedness was $72,252,000, the lowest since 1931; revenue receipts were $21,059,685, the highest since 1932. Assessable value of real and personal property was $1,055,416,742. An estimated $200,000,000 came to St. Louis before the close of 1940 in contracts for manufactures and construction of plane and armament plants. (E. L. R.)

St. Lucia: *see* WEST INDIES, BRITISH.
St. Pierre and Miquelon: *see* FRENCH COLONIAL EMPIRE.
St. Vincent: *see* WEST INDIES, BRITISH.

Saionji, Kimmochi (1849–1940), Japanese prince and statesman, was born in October at Kyoto and died on Nov. 24 in his villa at Okitsu. For a biographical sketch *see Encyclopædia Britannica,* vol. 19, p. 863.

Sales: *see* RETAIL SALES.

Salt. Scarcely any country on the face of the earth, civilized or uncivilized, fails to contribute in some degree to a total salt output that was estimated at 35,600,000 metric tons in 1937. The United States leads in production, with 28% of the total, followed by the soviet union, 14%, Germany 11%, the United Kingdom 10%, China 9%, France 7%, India 5% and Italy 5%. The United States' output reached a record figure of 9,278,000 short tons in 1939, while Canadian output was 425,000 tons. (G. A. Ro.)

Salvador, El, the smallest of the Central American republics, located on the Pacific coast; language, Spanish; capital, San Salvador; president, General Maximiliano Hernández Martínez. The area is 13,172 sq.mi. The population by the 1937 census was 1,631,967 and was officially estimated at 1,744,535 on Dec. 31, 1939, with 37½% urban. The chief cities, with 1940 estimates of population (including immediately adjacent rural areas) were: San Salvador, 104,000; San Vicente, 90,000; San Miguel, 44,100; Nueva San Salvador (or Santa Tecla), 33,000; Ahuachapán, 30,775; Sonsonate, 21,000; Santa Ana, 18,000.

El Salvador was quiet and politically stable throughout 1940, although some alarm was felt over fifth column activities in the latter months of the year. Following popular resentment over a parade of Italian residents in celebration of Italy's formal entry into the European war, all foreign political activity was proscribed by law on June 13. Later, a German consul was expelled. Economically, the country was hard hit by the closing of European markets which formerly absorbed 35% of its coffee exports, and the carryover at the end of the 1940 season (Aug. 31) was double that of 1939. Considerable relief was anticipated, however, from the Inter-American Coffee agreement of Nov. 1940, which allotted El Salvador 600,000 bags of 60 kg. for export to the United States (1939 exportation: 433,870 bags).

External communication is principally by sea and by Pan American Airways, supplemented by the Pan-American highway. There are 602 km. of railway. The 3,611 km. national highway system, already the best in Central America, is being rapidly expanded and improved. It includes 220 km. paved and 2,299 km. improved dirt roads and is complemented by 12,029 km. of local roads.

In 1939 exports were 31,875,665 colones (United States, 60·9%; Germany, 9%; Norway, 7·2%; Sweden, 4·3%; Honduras, 4·1%; Guatemala, 3·8%). Aside from coffee, the chief exports are gold and silver, sugar, balsam and henequen. The principal products are corn, which, along with considerable sugar and cotton, is produced for domestic consumption, and coffee for export. In 1940 corn and other food crops were generally subnormal. Coffee normally accounts for around 90% of export values (83·7% in 1939). During 1939, 62·9% of coffee exports went to the United States. There were 11,545 coffee plantations, over 92% of them owned by Salvadoreans, with 139,940,727 coffee trees in bearing in 1939. An area of 202,432 ac. is devoted to coffee.

The monetary unit is the colón (value: 40 cents U.S.). The 1940 budget estimated receipts at 21,321,650 colones, expenditures at 21,317,073 colones, with 14·6% allotted to education.

There were 1,296 primary schools, with an enrolment of 89,839 in 1938, 44 secondary and normal schools, and one university. (L. W. Be.)

Salvation Army. During 1940 the Salvation army celebrated its diamond jubilee, marking the 75th anniversary of the organization's founding by William Booth among the poor of London's East End in 1865. Observances were held in 97 countries and colonies where the army is carrying on its social and religious program. In contrast to its humble origin under one leader in a tent in Whitechapel, London, the 20,667 Salvation army institutions were in 1940 directed by 27,417 men and women officers who employed 104 languages or dialects in their labours. In the prosecution of its work the army published 126 periodicals, printed in many languages, with a combined circulation of 1,441,783 copies per issue.

The diamond jubilee also commemorated the 60th anniversary of the founding of the army's work in the United States. On March 10, 1880, Commissioner George S. Railton and seven officers arrived at Battery park in New York city from London, with the one purpose of reaching the poor and unchurched of the U.S. with a message of hope. From a single street meeting in 1880 the work of the Salvation army in 1940 was nationwide. Directed by 4,800 officers in 2,000 centres, the activities of the army in the United States in 1940 included: evangelistic meetings; shelters for men and women; rehabilitation centres for men; homes and hospitals for the unmarried mother and her child; clinics; children's homes; individual and family welfare; aid to prisoners and their families; free employment bureaus; search for missing relatives; summer outings for women and children; camps for children and youth; young people's social and religious instruction.

The administration of the organization in the United States is divided into four territories, each conducting a training college for officers and issuing weekly the *War Cry,* the official gazette. Commissioner Edward J. Parker, the national secretary, with headquarters at 120 West 14th st., New York city, co-ordinates administrative matters for the four U.S.A. territories.

The territorial commanders are: (Eastern) Commissioner Alexander M. Damon, 120 West 14th street, New York city; (Central) Commissioner Ernest I. Pugmire, 713 North State street, Chicago, Ill.; (Southern) Lt.-Commissioner William C. Arnold, 54 Ellis street, Atlanta, Ga.; and (Western) Lt.-Commissioner Donald McMillan, 115 Valencia street, San Francisco.

In addition to its regular social and religious program, the army during 1940 increased its welfare work among the combatant nations of the war in Europe and Asia.

During the conflict in Finland, Salvationists aided the government in its evacuation and resettlement program. Other Salvationists in Belgium and France, Germany and Holland, Norway and Denmark, England and Italy ministered to the fighting forces, accompanied refugees and gave aid to the stricken and shelterless. In France alone, the Salvation army operated 17 huts, 26 other buildings, 18 canteen-ambulances, until they were destroyed by the ravages of war. In England five departments of the Salvation army were wholly occupied with war relief activities.

Salvationists and friends in the United States contributed $194,667.02 for relief work abroad and collected more than 500 tons of clothing. (E. J. Pa.)

Samoa, American, a possession of the United States of America, lies about 2,700 mi. east of the northern tip of Australia and 2,200 mi. south of the Hawaiian islands; comprises the island of Tutuila and all other islands of the Samoan group E. of longitude 171° W., including Rose island, Tau, Olosega, Ofu, Aunuu, and Swain's. The principal island is Tutuila, area about 40 square miles. Pago Pago, the capital, population about 1,000, has the safest and best harbour in the South seas. Total population on June 30, 1940, 12,962, including 12,594 natives of Samoa (Polynesians); the remainder are foreign born and personnel of the U.S. naval establishment.

Public schools had an average enrolment of 2,770 during 1939–40. Health and sanitary conditions are excellent. All medical attention is given by naval medical officers who treat the natives free of charge. The only bank is the Bank of American Samoa, conducting a commercial banking business as a division of the treasury of the naval government of American Samoa, which owns the capital stock. Copra is the chief export of importance: 766 tons, returning $28,473, were exported during the copra crop year ending Jan. 31, 1940; 277 tons of mats, rugs and native curios, returning $50,204, were also exported during the fiscal year ending June 30, 1940. Imports: from U.S., $76,741; from New Zealand-Australia, $89,644; other, $9,141. The island has no indebtedness and receives no financial aid from the U.S. government. (L. S. F.)

Samoa, Western: *see* Mandates; Pacific Islands, Mandated.

Sand and Gravel. The leading uses of sand and gravel are in building construction and road paving; these account for 80% of the sand and 90% of the gravel consumption of the United States; the only other important use of gravel is as railroad ballast, which takes all but 1% of the remainder, but with sand, ballast accounts for only 2%, while the railroads use an additional 3% as engine sand; there are a number of industrial uses, the most important ones being in foundry work (8%), glass making (4%), and abrasives (1%). The total production increased by 7% in 1939, as compared with 1938, reaching 67,078,000 short tons of sand and 127,740,000 tons of gravel, a total of 194,818,000 tons.

The combined output of sand and gravel in Canada decreased by 12% in 1939 to 28,172,000 short tons. Production in the United Kingdom is less than in Canada, amounting to 17,796,000 long tons in 1938. Of this total 74% was used by the building industry and 17% for road metal and ballast. (G. A. Ro.)

Sandefer, Jefferson Davis (1868–1940), president of Hardin-Simmons university, Abilene, Tex., was born on a farm in Sharp county, Ark., March 13. He was a student at the summer school of the University of Texas for three years and in 1907 received a Ph.D. degree from the University of Chicago. After serving as president of Strawn college and John Tarleton college, and acting as superintendent of schools, he was elected president of Simmons college in 1909, which later became Hardin-Simmons university. He was one of the leaders of the Baptist church in Texas and served as president of its general convention. He died in Abilene, March 22.

Sand Island: *see* Midway Islands.
Sandstone: *see* Stone.

San Francisco, California, U.S.A., central port, financial and marketing centre of the Pacific coast, known as the "City by the Golden Gate"; area, 44·82 sq.mi.; population according to the U.S. census of 1940, 634,536. Of the city's population in 1930, 235,298 were native whites of native parent-

age, or 37·1%; 206,285 native whites of foreign or mixed parentage, or 32·5%; 153,386 foreign born whites, or 24·2%; 39,425 Negroes or of other races, or 6·2%; 338,033 males and 296,361 females.

History.—National defence contracts, and contracts awarded by the British government to manufacturers in San Francisco and the Bay area by Jan. 1, 1941, amounted to more than $600,000,000, of which approximately 85% was shipbuilding.

During the 382 days of the Golden Gate International exposition in 1939 and 1940, 2,530,643 tourists spent $328,762,470 in the state of California, which was $71,600,000 over the normal travel year of 1938.

Education.—There were 181 public schools in San Francisco, including 72 kindergartens, 82 elementary schools and 26 high schools, supplemented by numerous private, parochial, nonsectarian and technical schools. It was estimated that there were several thousand children in the city attending private schools. The University of San Francisco and the San Francisco State Teachers' college are located in the city, and the University of California at Berkeley and Stanford university at Palo Alto are both within easy commuting distance of San Francisco. In addition, the University of California maintains several branches in San Francisco, including colleges of medicine, dentistry, pharmacy and law, and the California School of Fine Arts; Stanford university's colleges of dentistry and medicine are also located in San Francisco.

Trade.—San Francisco contains the most compact market in the west, with 14,157 persons per square mile. Only New York city, Boston and Philadelphia exceed this density. The effective buying power of these people is the equivalent of 1,137,930 average Americans. The effective buying income per family in San Francisco amounts to $3,360, compared with $2,893 in California, $2,788 on the Pacific coast and $2,392 in the nation. The 1939 retail sales in San Francisco, reported by the U.S. census, amounted to $382,554,000.

The wholesale sales are estimated at the tremendous sum of $1,400,000,000. Sales at retail per capita amount to $603, leading all other key cities of the coast. Sales at wholesale exceed those of any other coast city.

Transportation.—Converging in San Francisco are seven major transcontinental rail routes, 177 steamship lines, more than 30 truck lines, four transcontinental bus services, three transcontinental air transport routes and the famous transpacific Clipper fleet. Today, San Francisco is the terminus of four Class I railroads and a number of short lines. Since the San Francisco-Oakland Bay bridge was opened on Nov. 12, 1936, it has been crossed by nearly 45,000,000 vehicles. The Golden Gate bridge, open since May 1937, has been traversed by almost 15,000,000 vehicles. (G. L. N.)

San Francisco Fair: *see* Art Exhibitions; Art Galleries and Art Museums; Electric Lighting; Fairs, Exhibitions, Expositions; San Francisco.

San Marino, a small republic of 38 sq.mi. in the Apennines, S.W. of Rimini, entirely surrounded by Italian territory, is ruled by a grand council and two regents ("Capitani Reggenti") appointed therefrom to exercise executive powers. The population (Sept. 1939) was 14,545, giving a density of about 383 per square mile. The capital (of the same name) has about 2,000 inhabitants. All able-bodied male citizens between 16 and 55, except teachers and students, serve in the militia. Building stone and wine are exported; there is an electric railway to Rimini. Italian currency is in use, but there is a local silver coinage and a separate issue of postage stamps. The budget estimate for 1939–40 balanced at 6,009,919 lire.

Santo Domingo: *see* Dominican Republic.
São Tomé: *see* Portuguese Colonial Empire.
Sarawak: *see* Borneo.

Sargent, Fred Wesley (1876–1940), president of the Chicago and North Western railroad company for 14 years, was born in Akron, Ia., May 26. He was educated at the University of South Dakota and the law school of Iowa State university. He was graduated from the law school in 1901 and began to practise in Sioux City. Five years later he was elected city attorney of Sioux City and re-elected in 1908. In 1920 he went to Chicago as general solicitor for the North Western. He served successively as general counsel and vice-president before being elected to the presidency of the company in 1925. He resigned because of ill-health in 1939. He died in Evanston, Ill., Feb. 4.

Saskatchewan, the middle of the three prairie provinces of Canada, was created a province by the dominion parliament Sept. 1, 1905. It has a total area of 251,700 sq.mi.; population 949,000 (estimate, Dominion Bureau of Statistics, 1939). The seat of government is Regina.

History.—The Liberal party, elected June 8, 1938, continued in power under the premiership of W. Patterson. There were no political happenings of special significance during 1940.

Economic.—The dollar value of the wheat crop (wheat growing is the first industry of the province) for the year 1940 was estimated at $135,200,000 as compared with a similar figure for 1939, and in contrast to $79,924,000 for 1938. Other grain crops were, in dollars: oats, $18,050,000 ($25,760,000, 1939); barley, $5,520,000 ($7,800,000, 1939); rye, $1,775,000 ($3,720,000, 1939); and flaxseed $1,750,000 ($1,680,000, 1939).

All field crops amounted to $167,014,000 as compared with $179,255,000 in 1939. Aggregate farm capital had in 1940 reached approximately $1,000,000,000. Other main sources of income were: minerals, $7,782,847; manufacturing, $62,205,884; fisheries, $486,646, as of 1938. These levels have been maintained since that time. (J. T. C.)

Saudi Arabia: *see* Arabia; Islam.
Sausage: *see* Meat.

Savage, Michael Joseph (1872–1940), prime minister of New Zealand, was born in Benalla, Australia, March 7. He left school at the age of 14 and worked successively as a clerk in a store, as a labourer on a sheep ranch and as a miner. He was interested in the labour movement and in 1900 became secretary of the Political Labour council in Victoria and organized a co-operative store. He went to New Zealand in 1907 and became an active leader in the labour movement there. He was elected to the house of representatives in 1919 and succeeded to the leadership of the Labour party in 1933. In 1935 his party won the election and he became prime minister in the first labour government. The party increased its majority in the elections three years later and Mr. Savage continued in power. He died in Wellington, N.Z., March 26.

Savings Banks, Mutual. The year ending July 1, 1940 was another year favourable to the increase of assets and deposits in mutual savings banks in the United States. Total assets on July 1, 1940 were $11,915,000,000, an increase of $173,600,000 over July 1, 1939, as compared with

an increase of $213,900,000 for the year ending July 1, 1939. Deposits credited to 15,756,823 accounts totalled $10,589,000,000 on July 1, 1940, the highest amount ever recorded. The combined surplus was $1,288,000,000, or 12·16% of total deposits. Dividends averaged 2·04% in 1940, a decline from 2·17% in 1939 and 2·50% in 1938. The total number of banks was reduced to 540, since during 1940 one bank was absorbed by a merger.

Investment policies of mutual savings banks did not change in 1940. The trend toward placing an increased amount of new investments in real estate mortgage loans continued. There were 146 savings banks that were "approved mortgagees" under the Federal Housing act. Loans insured under the Federal Housing act accounted for 17·6% of all the new mortgage loans made in 1939, and for 15·8% of all the new mortgage loans made in the first half of 1940. The policy of converting old mortgage loans to an amortized basis for repayment increased the total amount of funds available for investment and, in spite of the increased activity in new real estate mortgage loans, there remain surplus funds which, as formerly, are being invested in government bonds. More than 26% of total assets were invested in U.S. government direct and indirect obligations.

The second fiscal year of operation of insurance departments in New York state banks ended on Oct. 31, 1940, with eight issuing banks and ten agency banks engaged in the life insurance business, an increase of two issuing banks and three agency banks during the year. On that date there was $11,101,723 of insurance in force, representing 13,700 policies, an increase of $5,265,523 in insurance in force and of 6,694 policies since Oct. 31, 1939. In the state of Massachusetts there were 29 issuing banks and 106 agency banks on Oct. 31, 1940, an increase of three issuing banks and five agency banks during the year. In that state there was $192,000,000 of insurance in force, representing 212,000 policies, an increase of $19,000,000 in insurance in force and of 33,200 policies since Oct. 31, 1939.

After one year of operation, several changes were made in the New York statute governing savings bank life insurance, to conform with the views of savings banks. The changes were made to encourage more banks to enter the business. They were designed to place more responsibility on savings-insurance banks for the administration of the system than the original law permitted, without diminishing the supervisory functions of the state insurance and state banking departments, to which all the administration duties were at first also assigned. The amendment provided that contributions to the insurance guaranty funds could be made from the savings banks; whereas originally these funds were required to be subscribed by individuals.

If the mutual savings banks in the United States experienced few innovations in 1940, the savings banks in Europe had to meet changes that were catastrophic. No reports were available from the continent since April 1940, but the last figures received show the 1939 monthly deposits and withdrawals in savings banks in France, the Low Countries, Bulgaria and Greece. The outbreak of the war was followed by large withdrawals from savings banks in all these countries. In France the net loss in deposits for the month of Sept. 1939 was 1,654,000,000 francs, or 4% of total deposits. This trend was reversed in October, and by the end of the year more than half of this loss had been regained. There was a net gain for the entire year of 234,000,000 francs, which brought total deposits to 40,500,000,000 francs on Dec. 31, 1939, exclusive of interest credited for 1939. In Bulgaria and Greece also, the net losses realized in Sept. 1939 were followed by net gains in deposits for the balance of the year, but in Belgium, Holland and Denmark the net losses continued. For the year as a whole the savings banks in all of these five countries, except Bulgaria, had substantial net losses in deposits.

Balances in trustee savings banks of Great Britain amounted to £310,264,000 on Aug. 31, 1940, a gain of £22,467,000 for the year ending that date, as compared with a gain of £15,700,000 for the previous year. The old issue of national savings certificates, sold through post offices, savings banks and joint stock banks for the government, was replaced by a new issue at the beginning of the special war savings campaign in Nov. 1939. The issue permits the purchase of units of 15 shillings, which increase in value after five years to 17 shillings and sixpence, and after ten years to 20 shillings and sixpence. These certificates are free of income tax and may be cashed at any time. No individual may hold more than 500 savings certificates of any or all issues. A new security known as a defence bond was provided to attract more savings from the lower income groups for war expenses. Defence bonds bear 3% interest and may be purchased only in multiples of five pounds. They are repayable at par seven years from date of purchase at a premium of £1 per centum. Or they may be cashed for full value on six months' notice, or, in case of need, within a few days. Individual holdings of defence bonds are limited to £1,000. On Sept. 15, 1940 the special war savings campaign had raised £147,041,275 through the sale of national savings certificates, and £149.731,450 from the sale of defence bonds. Balances in post office and trustee savings banks had increased £63,077,000 since the beginning of the war savings campaign in Nov. 1939. (He. Br.)

Schereschewsky, Joseph Williams (1873–1940), U.S. cancer expert, was born in Peking, China, March 6, and was taken to the United States in his infancy. He was graduated from Harvard college in 1895 and from the medical school of Dartmouth in 1899. He was appointed an assistant surgeon in the United States Public Health service in November of the same year and was promoted through various grades until he became medical director in 1930. In 1922 he was put in charge of governmental investigations into the causes of cancer and established a research centre at the Harvard Medical school. In 1937 he organized a cancer control program for the state of Georgia. Among his other activities was the study of occupational diseases. In 1916 he was president of the American Association of Industrial Physicians and Surgeons. He died at West Harwich, Mass., July 9.

Schizophrenia: *see* Nervous System; Psychiatry.
Scotland: *see* Great Britain and Northern Ireland, United Kingdom of.

Scudder, Janet (1873–1940), U.S. sculptor and painter, was born in Terre Haute, Ind., Oct. 27. She studied art in Cincinnati, Chicago and in the Paris studio of Frederick MacMonnies. She won a medal for her work at the Columbian exposition in Chicago in 1893 and other medals at expositions in St. Louis, San Francisco, Amsterdam and Paris. She designed many fountains, notably the frog fountain in the Metropolitan Museum of Art in New York city. She was a chevalier of the Legion of Honour and an associate of the National academy. She died in Rockport, Mass., June 9.

Sculpture. The year 1940 was not productive of as spectacular opportunities as 1939 when government art patronage was at its highest stage. The two international expositions of that year put numerous exceptional projects within the reach of talented sculptors. But there was a definite surge of activity on the part of national and civic groups aimed at keeping vital the creative spirit in sculpture and encouraging public appreciation and support.

Museums were active in exhibiting sculpture and made also some notable acquisitions. Important competitions were promoted. A few prominent public memorials were projected or completed. Promotion of sculpture through exhibitions assumed its most important form in large scale activities such as the Sculpture Festival held by the National Sculpture society at the Whitney Museum of American Art. Consisting of the work of about 185 exhibitors, this exhibition was impressive in its illustration of the conservative aspects of contemporary sculpture, although considerable work by artists of the newer schools was included. Major events occurred also in the historical field.

Notable opportunities for study and appreciation of sculpture of the 18th and 19th centuries were afforded. Representing the earlier period was a distinguished exhibition of French sculpture from the M. David-Weill collection of Paris at the Wildenstein galleries, an exhibition rich in portraits and symbolical works by famous classicists, such as Houdon, Lemoyne, Pigalle, Coysevox and Pajou. These pieces, vastly prized by collectors of the past, served vividly to revive impressions of the courtly splendour and magnificence of the period they originally adorned. A later period was that represented by the 19th century *animalier,* Antoine Louis Barye, a comprehensive selection of whose bronzes was exhibited at the Metropolitan Museum of Art. The latter made the most of its notable collection to reaffirm the importance of Barye, especially in the field of dramatic animal interpretation.

But 1940's most sensational event was the showing, first in New York city and later in other cities throughout the U.S., of Jacob Epstein's controversial statue of "Adam," a seven-foot figure of massive pink alabaster symbolizing "primitive man." Epstein's work, which had created a furore in England, was sent to the U.S. for the purpose of raising funds to buy aeroplanes for

Below: CLASSICAL NUDE at the House of German Art in Munich, 1940

MODEL FOR MARBLE EAGLES on façade of Federal Office building, New Orleans, La., by Gifford Proctor

Above: SECTION OF CARL MILLES'S "The wedding of the Rivers," unveiled in May 1940 in St. Louis, Mo.

Above: "DE ANZA," a 14-foot figure by Sherry Peticolas, at Riverside, Calif.

Right: "MADONNA," a walnut statuette by Wynne Byard Taylor of Bryn Mawr, Pa., exhibited at the international sculpture show in 1940 at the Philadelphia museum

Left: "LITTLE DUTCH GIRL," a terra cotta figure by Joseph Kiselewski at Parkchester housing project, New York city

Great Britain. Exhibited with a group of portrait busts by the artist, it attracted the interest of the curious.

It appealed, however, less to those inclined to appraise the work purely as an object of art.

Museum acquisitions involved relatively few works of outstanding importance. The new National Gallery of Art in Washington, which soon opened to the public, obtained two historical fountains formerly ornamenting the 17th century Théâtre d'Eau, the open-air theatre built for Louis XIV at Versailles, France, and planned to use them to decorate the garden courts which were impressive architectural features of the gallery. Among the surviving elements of that theatre's decoration, they are considered excellent examples of the sculpture of the period. On the other hand contemporary sculpture was more prominent numerically, and among the largest groups was the gift of 36 pieces by Mrs. John D. Rockefeller, Jr., to the Museum of Modern Art in New York—including works by Maillol, Lehmbruck, Despiau, Modigliani, Lachaise and Zorach.

Lehmbruck's heroic "Standing Youth" was one of the most remarkable of these pieces.

The unveiling of Victore Salvatore's statue of James Fenimore Cooper, the novelist and author of the *Leatherstocking Tales,* at Cooperstown, N.Y., added to the monumental sculpture commemorating famous Americans which was placed throughout the U.S. during the year. Relatively few pieces achieved prominence, however, though several new projects were approved, including a statue of Paul Revere by Cyrus E. Dallin which was authorized for Boston by the trustees of the White fund. This bronze equestrian monument, when completed, will stand in a park near the Revere home.

Federal sponsorship of public sculpture was continued in 1940, though on a somewhat smaller scale than in the year before, with one of the major competitions held by the Section of Fine Arts involving the selection of two groups by a young artist, Robert Cronbach, for the new Social Security building in Washington. This artist was commissioned to complete in large scale bronzes statues submitted in model form on the subject of social security. The groups chosen were designed in semi-abstract style, one consisting of a worker symbolizing "Independence" and the other a mother and child group entitled "Shelter."

Europe.—In Europe sculptural achievement was necessarily greatly limited on account of the European war. Though definite attempts were made especially in France and Great Britain to preserve normal activity in the arts, intense preoccupation with the struggle in Britain, and the invasion of France prevented artists from carrying out their most important work.

From the continent in fact very little indicating the progress of sculptural work was forthcoming during 1940. (*See* also ART EXHIBITIONS.) (C. BU.)

Sea Blockade: *see* BLOCKADE.

Secondary Education: *see* EDUCATION, SECONDARY.

Secondary Metals. The recovery of secondary metals in the United States and their return to industry for re-use has grown to such an extent that in many cases the yield is so large a proportion of the total consumption that the consuming industries would be seriously handicapped without access to this additional supply.

On the other hand, secondary recovery is viewed unfavourably by the primary producer, because it restricts the demand for new metal.

Very little information was available in 1940 on secondary recovery outside of the United States. No other country has developed it to the degree prevailing in the United States, but pressure of circumstances has probably pushed it farther in Germany than elsewhere. (G. A. RO.)

Secondary Metals Recovered in the United States

	1936	1937	1938	1939
Copper—Thousands of short tons				
As metal	260.0	285.6	192.4	151.4
In alloys	224.6	246.5	167.4	245.1
In chemical compounds	?	?	?	3.2
Total	484.6	532.1	359.8	399.7
Percentage*	65	62–78	60–74	62–57
Lead—Thousands of short tons				
As metal	137.5	154.5	119.4	86.9
In alloys	125.4	120.6	105.5	148.8
In chemical compounds	?	?	?	5.8
Total	262.9	275.1	224.9	241.5
Percentage*	42	41	41	36–87
Zinc—Thousands of short tons				
As metal	68.0	64.5	42.3	53.2
In alloys	54.1	62.8	44.8	98.9
In chemical compounds	?	?	?	54.8
Total	122.1	127.3	87.1	206.9
Percentage*	21	21	21	33–78
Tin—Thousands of short tons				
As metal	7.2	8.3	4.9	4.5
In alloys	20.8†	20.3	17.3	24.9
In chemical compounds	?	1.7	1.4	0.7
Total	28.0	30.3	23.6	30.1
Percentage*	40	35	47	42
Aluminium—Thousands of short tons				
As metal	20.9	29.4	16.7	2.9
In alloys	30.6	33.2	22.1	47.1
Total	51.5	62.6	38.8	50.0
Percentage	42	38	26.5	34–70
Nickel—Thousands of short tons				
As metal	0.9	0.9	0.8	...
In alloys†	1.1	1.5	1.5	2.9
Total	2.0	2.4	2.3	2.9
Percentage*	5	5	10	5–35
Antimony—Thousands of short tons				
As metal	9.2	11.5	7.8	9.8
In alloys	0.7	0.8	0.7	
Total	9.9	12.3	8.5	9.8
Percentage*	66	69	77	83–98
Platinum—Thousands of troy ounces	56.0	55.9	44.7	45.4
Percentage	50	65	48	32
O.P.M.‡—Thousands of troy ounces	10.2	16.4	19.7	18.0
Gold—Thousands of troy ounces	?	?	870.9	895.1
Silver—Thousands of troy ounces	?	?	18,438.8	24,972.3

*Ratio of secondary recovery to consumption of new metal; where a second figure appears, this is the percentage of the total secondary metal recovered from *old* materials, the remainder having come from the reworking of new plant scrap.
†Includes some in chemical compounds. ‡Other platinum group metals.

Second World War: *see* EUROPEAN WAR.

Securities and Exchange Commission (SEC): *see* BANKRUPTCY; LEGISLATION: *Federal;* PUBLIC UTILITIES; STOCK EXCHANGES.

Seeing Eye, the corporate society that educates dogs to be the trusted guides and friends of blind men and women, had in 1940 the most successful year since its inception in 1928 when Morris Frank brought his German shepherd, Buddy I, from Mrs. Harrison Eustis's kennels in Switzerland. Bred for "character" and trained by Mrs. Eustis and Elliott S. Humphrey, the geneticist, Buddy I was the dog that proved Seeing Eye dogs could safely guide blind people through heavy American street traffic; and it is primarily due to her that in 1940, 537 dogs were leading their 537 blind owners from darkness and dependence into light and liberty. Mr. Frank works for the Seeing Eye with Buddy II, a handsome male dog, for his guide and friend; a new wing has been added to the headquarters at Morristown, N.J.; and 87 more dogs than in 1939 were active in 45 states, in the District of Columbia and in Canada.

Seeing Eye dogs are "attending college" as pilots to student masters; dogs are being guides in such diversified occupations as the law, teaching, undertaking, the ministry, journalism, electrical engineering, pharmacy, music and a great variety of mercantile pursuits, including selling insurance, hardware, groceries and raising poultry. In addition to supplying trained dogs for 537 blind persons mentally and physically capable of benefiting from a dog, the Seeing Eye makes notable progress in informing a sympathetic public of the Seeing Eye's need for financial support—each dog costs many times the amount paid by the blind purchaser. (B. TA.)

Seismology. Seismology maintained progress in 1940 in many parts of the earth but suffered in the regions where war was going on. International machinery for dealing with the subject was seriously affected. Following the great earthquake of Dec. 27, 1939 in Turkey, strong shocks continued through Feb. 19, 1940. A strong earthquake in Rumania on Oct. 22 was followed by a great one on Nov. 10, with great property damage and loss of life. A destructive earthquake occurred in the Imperial Valley, Calif., on May 19. Moderate but widespread shocks in New Hampshire on Dec. 20 and 24 marked a renewal of activity in the New England area.

The strong-motion record of the Imperial Valley earthquake was analyzed by mechanical and mathematical methods, with resultant valuable information about the ground motions and information useful in the design of all types of structures, including dams, bridges, water towers and buildings. The same information was used to secure better simulation of earthquake in the motions of shaking platforms on which models of proposed structures are tested. Building construction codes were being improved as new information became available.

A new seismograph for recording nearby earthquakes was developed. Studies were made of the small tremors, not of seismic origin, known as microseisms. Attention was also given to the question whether earthquakes are caused by change of loading of the earth's crust due to large lakes behind dams.

Though earthquake prediction in time, place and maximum intensity remains impossible, no means was neglected of determining whether stress is growing at the earth's surface. Special attention was given to levelling, triangulation and tilt-measurement. (N. H. H.)

Selective Service. The year 1940 witnessed a drastic and significant change in U.S. national life. With the enactment of the Selective Training and Service Act of 1940, the United States implemented and integrated the greatest national defence program in its history. Early in 1940, congress inaugurated a national defence rearmament program involving the expenditure of more than $15,000,000,000.

With the memory of U.S.A.'s unpreparedness in 1917 still fresh in their minds, the members of the 66th congress had passed the National Defence Act of 1920, which provided it was to be the duty ". . . of the war department general staff . . . to prepare plans . . . in conjunction with the naval forces . . . for the mobilization of the manhood of the nation. . ." But in 1919 the selective service laws were allowed to lapse. The selective service organization was disbanded. From 1920 to 1926 the congressional mandate "to prepare plans" was fulfilled by occasional conferences between war and navy department officials. In 1926 these officials recognized the need for the assignment of qualified officers whose responsibility and function it would be to carry out the letter and the spirit of the law.

Joint Army and Navy Selective Service Committee.—After an interchange of letters between the secretary of war and the secretary of the navy, and on their recommendation, the Joint Army and Navy Selective Service committee was created on Jan. 22, 1926. The original committee comprised four officers: one from the marine corps and one from the bureau of navigation for the navy; and two from the army personnel division for the war department. Its first effort was to analyze and study the experiences of selective service during the war of 1914–18, in order to establish future policies and procedures that were tried and proved successful. It soon became apparent that the committee's greatest need was men; men capable of undertaking a long range program of study, research and planning.

Two major considerations argued that they should not be regular army, navy or marine corps officers.

First, a long range planning program could not be carried out by regular officers who usually receive a change of assignment every four years. Second, a military education or background was not essential, because the problems of procuring civilians for military service demanded rather a knowledge of civilians and a civilian background.

The secretaries of war and navy made an allotment of 95 reserve officers to assist the committee. These civilian reserve officers were to represent a cross section of U.S. national life. They were to be selected from all parts of the United States and were, in so far as it was possible, to represent varied fields of civilian endeavour.

After establishing broad general policies based on the study and research of previous experience, the committee then outlined a course of further study and research by, and education of, its assigned reserve officers through a series of correspondence courses. When these reserve officers had been indoctrinated in the policies and philosophies established by the committee and educated in the fundamentals of selective service, the committee began to formulate plans and regulations for the organization and operation of a nationwide man power procurement agency—the selective service system.

By 1935 policies and procedures were established; plans and

Page 1

Column 1 Read down this column and then start at the top of Column 2	Column 2 Read down this column and then start at the top of Column 3	Column 3 Read down this column and then start at the top of Column 4	Column 4 Read down this column and then start at the top of Column 5	Column 5 Read down this column and then start at the top of Column 1 Page 2
158	7745	4674	6359	3200
192	5747	5942	6396	8795
8239	4746	8038	7952	57
6620	5854	5248	2502	8995
6685	5358	4326	4727	5642
4779	8107	8300	8597	2684
8848	4889	5325	6690	4483
6262	2670	4670	6385	6457
8130	8852	3984	5998	4416
5892	5913	4959	5136	2988
5837	6129	4543	7999	153
5485	6126	8211	6908	7102
6604	6573	3461	4996	5788
8946	3048	5029	3675	3670
5375	7900	5660	3440	7166
7674	8313	4956	4568	4337
4880	4050	4805	2524	5394
4928	7099	6503	6192	7584
105	5520	161	4054	8768
6582	7858	3011	3466	6758
6729	8309	6741	4070	8238
7508	7090	7368	3001	5927
7857	6887	7659	4462	8861
5995	4220	5911	5951	4038
4861	8395	5987	3694	6594
6116	4931	6576	5396	5317
5527	4815	7950	5598	6813
5055	7973	7414	3408	5643
3508	3470	3294	8705	7768
4767	3495	2470	6169	5456
7647	4977	14	6107	6414
6238	6613	4012	2437	5131
7293	8550	4159	6313	7451
2441	5172	5871	6196	4838
7120	2451	6642	3974	7401
7775	2748	8389	4261	6458
2563	8402	6347	6176	6679
4440	7275	5666	5488	4120
8672	2698	5127	6888	4831
5486	4645	3259	5550	6830
188	5841	3526	6403	5722
6241	6654	5309	8165	4856
8296	7934	2771	3252	4765
6306	846	7251	6681	7212
6840	2764	6336	6235	6671
120	4631	2489	3432	8738
8060	7012	8804	4760	6844
4933	7229	5011	7927	6020
8147	7367	4966	2534	5651
2914	8963	8963	7587	7657 *

*Go to Page 2 and begin at top of Column 1.

FIRST PAGE FROM NATIONAL MASTER LIST, first drawing, Oct. 29–30, 1940 under Selective Training and Service Act of 1940

regulations had been formulated, complete details for the organization, administration and operation of the national headquarters had been worked out. As a first step toward carrying out its planning, the adjutant general of the national guard in each state was asked to co-operate and work out details for the organization, administration and operation of selective service in his state. To assist in this work there were the trained reserve officers who were available for liaison and conference work.

By this time the original four-man committee had been increased by the addition of one reserve officer who had served with the selective service headquarters in the war of 1914–18, one national guard officer and two industrial advisers; one from the bureau of shore establishments for the navy and one from the office of the assistant secretary of war for the army. With the help of the committee and its assigned reserve officers, the state adjutants general and their staffs undertook the planning of the organization and operation of selective service in the various states, the District of Columbia, Hawaii and Puerto Rico. This work progressed through the years by means of summer training camps, weekly drill instruction periods, extension courses and conferences.

By 1936 over 100 officers, including national guard and naval liaison officers, were attending each of the four annual regional conferences. These conferences were of 14 days' duration and were held in different sections of the country so as to minimize travel time and expense. Nearly 7,000 extension course lessons were being completed annually by officers throughout the country.

When Major Lewis B. Hershey in July 1940 said that the Joint Army and Navy Selective Service committee was "ready," he said it in the full knowledge that the study and analysis of selective service of 1917 and the 14 years of subsequent study, research, planning and training guaranteed the success of any selective service program that was based on the committee's recommendations. The committee had worked out policies and procedures, rules and regulations and details of organization, administration and operation. Its allotment of 95 reserve officers was trained and ready, if called, to function as a national headquarters and as liaison officers with the various states. Each state had an adjutant general and a state staff, trained and ready, if called, to function as a state headquarters. Altogether there were about 350 officers of the army, navy and marine corps, the reserves and the national guard, who were trained specialists in selective service.

The congress of 1920 had told the war and navy departments "to prepare plans." By 1940, the plans had been prepared. The organization, machinery and details of operation outlined in the legislation before congress were identical with the plans of the committee. Said the United States senate: "Aye" by a vote of 47 to 25. Said the house of representatives: "Aye," 232 to 124. On Sept. 16, President Roosevelt signed the Selective Training and Service Act of 1940.

Selective Training and Service Act of 1940 (Condensed)

The purpose of the act is to provide for the common defence by increasing and training the armed forces under a fair and just system.

Excepting those already in military service, public health service, and aliens of certain recognized status, every male citizen and alien between the ages of 21 and 36 residing in the United States on the day or days fixed shall register.

Whether or not a state of war exists, the president may increase the forces from time to time as the national interest requires so long as there are never over 900,000 men in training and service in any one year under this act. The act will continue in effect for five years. And the president may induct no more men than the congress shall specifically appropriate for from time to time.

Physical examination by the military services shall be given the men upon induction and discharge.

Each man inducted shall serve 12 months, after which he will be placed in a reserve component for 10 years.

The same pay allowances, pensions, disability and death compensation provided for other enlisted men and officers of like grade and length of service are assured inductees under this act.

These inductees shall not be employed beyond the limits of the western hemisphere except in the territories and possessions of the United States, including the Philippine islands.

THE FIRST NUMBER—158—was drawn by Secretary of War Stimson in the U.S. draft lottery Oct. 29, 1940 at Washington, D.C. He is shown being blindfolded before picking the first capsule from the same "goldfish bowl" used in the 1917 draft. President Roosevelt is at the left

Classification, selection and induction under the act shall be made in an impartial manner under such regulations as the president may prescribe.

The number of inductees shall be based on the state's proportion of eligible men compared to the total number of the nation's eligibles, except that credits shall be given for residents of each subdivision who are in the land and naval forces.

The act defers from training and service the following men in the armed forces: those who have served three consecutive years in the regular army; former national guardsmen and former reserve officers, under certain conditions; the vice-president, governors, members of state and federal legislatures, judges of courts of record.

No exception from registration or exemption or deferment from training and service under this act shall continue after the cause therefor ceases to exist.

Inductees leaving non-temporary positions with the federal government or private industry are protected by the act and are to be reinstated with no loss of seniority or privilege and may not be discharged without cause for at least one year after their return. The district courts of the United States are given jurisdiction in cases arising under this provision.

A personnel division is to be organized to secure re-employment and employment for men as they complete the training period.

No vacancy created by induction is to be filled by any member of the Communist party or the German-American bund.

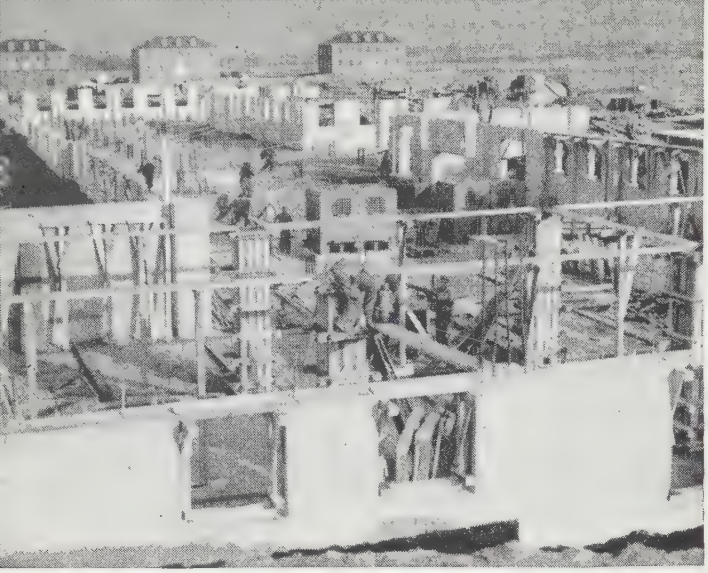
The president is authorized to prescribe rules for deferments of: certain men whose occupation, or preparation therefor, is found necessary to national interest and also certain important office holders in the state and federal service; those physically, mentally or morally unfit for service; men with dependents; students entered during 1940 in recognized colleges until graduation or July 1, 1941, whichever occurs first.

Dependent when used in the act means one who is dependent in fact.

Recognized students and ministers of religion are not subject to military training, but must register. Non-combatant and non-military service is provided for conscientious objectors.

The president is empowered to place obligatory orders with any firm or individual for such defence materials as are required and which are of the nature usually produced or capable of being produced by such firm or individual. Upon refusal to comply authority is given to take immediate possession and such failure is deemed a felony which upon conviction carries a penalty of three years' imprisonment and a fine not exceeding $50,000. Just compensation for materials and rent is assured.

The president is authorized: (1) to prescribe the necessary rules and regulations to carry out the provisions of this act; (2) to create and establish a Selective Service system, and shall provide for the classification of registrants and of persons who volunteer for induction under this act on the basis of availability for training and service, and shall establish within the Selective Service system civilian local boards and such other civilian agencies, including appeal boards and agencies of appeal, as may be necessary to carry out the provisions of this act. There shall be created one or more local boards in each county or political subdivision corresponding thereto of each state, territory and the District of Columbia. Each local board shall consist of three or more members to be appointed by the president, upon recommendations made by the respective governors or comparable executive officials. No member of any such local board shall be a member of the land or naval forces of the United States, but each member of any such local board shall be a civilian who is a citizen of the United States residing in the county or political subdivision corresponding thereto in which such local board has jurisdiction under rules and regulations prescribed by the president. Such local boards, under rules and regulations prescribed by the president, shall have power within their respective jurisdictions to hear and determine, subject to the right of appeal to the appeal boards herein authorized, all questions or claims with respect to inclusion for, or exemption or deferment from, training and service under this act of all individuals within the jurisdiction of such local boards. The decisions of such local boards shall be final except where an appeal is authorized in accordance with such rules and regulations as the president may prescribe. Appeal boards and agencies of appeal within the Selective Service system shall be composed of civilians who are citizens of the United States. No person who is an officer, member, agent or employee of the Selective Service system, or of any such local or appeal board or other agency, shall be excepted from registration, or deferred from training and service, as provided for in this act, by reason of his status as such officer, member, agent or employee; (3) to appoint by and with the advice and consent of the



ARMY BARRACKS for a complete division were speeded up in 1940 at Fort Dix, N.J., to house the new conscripts and volunteers

senate, and fix the compensation at a rate not in excess of $10,000 per annum, of a director of selective service who shall be directly responsible to him and to appoint and fix the compensation of such other officers, agents and employees as he may deem necessary to carry out the provisions of this act; *provided*, that any officer on the active or retired list of the army, navy, marine corps or coast guard, or of any reserve component thereof or any officer or employee of any department or agency of the United States who may be assigned or detailed to any office or position to carry out the provisions of this act (except to offices or positions on local boards, appeal boards, or agencies of appeal) may serve in and perform the functions of such office or position without loss of or prejudice to his status as such officer in the army, navy, marine corps, or coast guard or reserve component thereof, or as such officer or employee in any department or agency of the United States: *provided further*, that any person so appointed, assigned or detailed to a position the compensation in respect of which is at a rate in excess of $5,000 per annum shall be appointed, assigned, or detailed by and with the advice and consent of the senate: *provided further*, that the president may appoint necessary clerical and stenographic employees for local boards and fix their compensation without regard to the Classification Act of 1923, as amended, and without regard to the provisions of civil service laws; (4) to utilize the services of any or all departments and any and all officers or agents of the United States and to accept the services of all officers and agents of the several states, territories and the District of Columbia and subdivisions thereof in the execution of this act; and (5) to purchase such printing, binding and blank-book work from public, commercial, or private printing establishments or binderies upon orders placed by the public printer or upon waivers issued in accordance with section 12 of the Printing act approved January 12, 1895, as amended by the Act of July 8, 1935 (49 Stat. 475), and to obtain by purchase, loan, or gift such equipment and supplies for the Selective Service system as he may deem necessary to carry out the provisions of this act, with or without advertising or formal contract; and (6) to prescribe eligibility, rules and regulations governing the parole for service in the land or naval forces, or for any other special service established pursuant to this act, of any person convicted of a violation of any of the provisions of this act.

The president is further authorized to delegate any authority vested in him under this act to such officers, agents or persons as he may designate.

Voluntary services may be accepted.

The chief of finance, United States army, is designated as fiscal, disbursing and accounting agent for selective service.

Any person charged with the duty of carrying out any of the provisions of this act, or the rules or regulations made or directions given thereunder, who shall knowingly fail or neglect to perform such duty, and any person charged with such duty, or having and exercising any authority under said act, rules, regulations or directions who shall knowingly make, or be a party to the making, of any false, improper or incorrect registration, classification, physical or mental examination, deferment, induction, enrollment or muster, and any person who shall knowingly make, or be a party to the making of, any false statement or certificate as to the fitness or unfitness or liability or non-liability of himself or any other person for service under the provisions of this act, or rules, regulations or directions made pursuant thereto, or who otherwise evades registration or service in the land or naval forces or any of the requirements of this act, or who knowingly counsels, aids or abets another to evade registration or service in the land or naval forces or any of the requirements of this act, or of said rules, regulations or directions, or who in any manner shall knowingly fail or neglect to perform any duty required of him under or in the execution of this act, or rules or regulations made pursuant to this act, or any person or persons who shall knowingly hinder or interfere in any way by force or violence with the administration of this act or the rules or regulations made pursuant thereto, or conspire to do so, shall, upon conviction in the district court of the United States having jurisdiction thereof, be punished by imprisonment for not more than five years or a fine of not more than $10,000, or by both such fine and imprisonment, or if subject to military or naval law may be tried by court martial, and, on conviction, shall suffer such punishment as a court martial may direct. No person shall be tried by any military or naval court martial in any case arising under this act unless such person has been actually inducted for the training and service prescribed under this act or unless he is subject to trial by court martial under laws in force prior to the enactment of this act. Precedence shall be given by courts to the trial of cases arising under this act.

The monthly base pay of enlisted men of the army and marine corps shall be as follows: enlisted men of the first grade, $126; enlisted men of the second grade, $84; enlisted men of the third grade, $72; enlisted men of the fourth grade, $60; enlisted men of the fifth grade, $54; enlisted men of the sixth grade, $36; enlisted men of the seventh grade, $30; except that the monthly base pay of enlisted men with less than four months' service during their first enlistment period and of enlisted men of the seventh grade whose inefficiency or other unfitness has been determined under regulations prescribed by the secretary of war, and the secretary of the navy, respectively, shall be $21. The pay for specialists' ratings, which shall be in addition to monthly base pay, shall be as follows: first class, $30; second class, $25; third class, $20; fourth class, $15; fifth class, $6; sixth class, $3. Enlisted men of the army and the marine corps shall receive, as a permanent addition to their pay, an increase of 10 per centum of their base pay and pay for specialists' ratings upon completion of the first four years of service, and an additional increase of 4 per centum of such base pay and pay for specialists' ratings for each four years of service thereafter, but the total of such increases shall not exceed 25 per centum. Enlisted men of the navy shall be entitled to receive at least the same pay and allowances as are provided for enlisted men in similar grades in the army and marine corps.

When used in this act the United States refers to the several states, the District of Columbia, Alaska, Hawaii and Puerto Rico.

Registration Day for Selective Service.—In accordance with the provisions of the act, President Roosevelt appointed Clarence Addison Dykstra, president of the University of Wisconsin, as the director of selective service, at a salary of $10,000 a year and proclaimed Oct. 16, 1940 as registration day for the continental United States. Proclamations set registration day on Oct. 26 for Hawaii, Nov. 20 for Puerto Rico and Jan. 22, 1941 for Alaska.

In accordance with the prearranged plan of the Joint Army and Navy Selective Service committee, the governors of the several states and the adjutants general and state staffs immediately undertook to set up the registration machinery. Federal, state and municipal employees—in some cases—city and state-wide organizations, such as police departments and school systems, were called into service. Polling places, schoolhouses, police stations and the like, were set up and organized as registration places. Day and evening classes were organized to instruct volunteer registrars in their duties and responsibilities.

On Oct. 16, 1940 more than 1,000,000 American men and women voluntarily served as registrars in more than 125,000 registration places throughout the U.S.A. Between 7.00 A.M. and 9.00 P.M. more than 16,000,000 men were registered in the continental United States.

Selective Service System.—While the preparations for registration day were being made, President Roosevelt issued an executive order which created the Selective Service system. The Joint Army and Navy Selective Service committee and a number of its assigned reserve officers became the nucleus of the national headquarters of the Selective Service system. The adjutants general and their staffs in the various states became the nucleus of the state headquarters. Each governor was asked to nominate a state selective service director for appointment by the president. This state director was to be the operating head of the Selective Service organization in each state. The governors were also asked to nominate those who were to be appointed by the president as members of local boards, appeal boards, examining physicians and government appeal agents.

Speedily and efficiently the entire nationwide Selective Service system was organized and implemented. The outstanding characteristic of the Selective Service system was the almost complete decentralization of its organization and operation. Director Dykstra and a trained and experienced staff comprised the national headquarters. The main function of the national headquarters was to direct and co-ordinate the activities of the various state headquarters.

The state director and a trained and experienced staff comprised each state headquarters. The main function of these state headquarters was to direct and co-ordinate the activities of the local boards, advisory boards, appeal boards, examining physicians, government appeal agents and medical advisory boards in their respective states.

In each state a local board was created for each county, except where there were more than 30,000 people in a county, in which case additional boards were created, so that there was one local board to serve each 30,000 people. These local boards were comprised of not less than three members. Attached to each local board were one or more examining physicians and one government appeal agent. A total of 6,256 local boards were created to serve continental United States, together with 25 for Hawaii and 122 for Puerto Rico. In these local boards rested the real administrative and functional responsibility in the selective service system. Each local board was responsible for the classification and resultant deferment or induction of the registered men in its local board area.

The examining physicians made the physical examinations and reported their recommendations to the local board as to the physical fitness of registrants. The government appeal agent assisted registrants and advised them regarding appeals and protected the government by appealing any local board classification not in the best interests of the government.

Table I.—*Registration of U.S. Manpower for National Defence, Tabulated by States*

State	Registration	State	Registration
Alabama	339,349	Nevada	18,133
Arizona	60,604	New Hampshire	55,333
Arkansas	230,294	New Jersey	540,308
California	935,532	New Mexico	66,610
Colorado	126,025	New York	1,709,715
Connecticut	224,781	North Carolina	448,283
Delaware	34,334	North Dakota	74,551
District of Columbia	114,341	Ohio	840,707
Florida	251,378	Oklahoma	261,953
Georgia	389,651	Oregon	133,334
Idaho	70,225	Pennsylvania	1,235,442
Illinois	1,008,316	Rhode Island	84,486
Indiana	414,162	South Carolina	239,383
Iowa	287,150	South Dakota	71,037
Kansas	192,881	Tennessee	360,417
Kentucky	328,956	Texas	808,588
Louisiana	306,367	Utah	65,222
Maine	90,119	Vermont	39,894
Maryland	241,995	Virginia	343,268
Massachusetts	494,582	Washington	204,631
Michigan	676,536	West Virginia	237,286
Minnesota	328,987	Wisconsin	365,577
Mississippi	257,303	Wyoming	33,330
Missouri	440,333		
Montana	76,914	Subtotal	16,316,908
Nebraska	142,305		
Hawaii*, 60,136; Puerto Rico†, 243,449; Alaska‡, 8,500§			312,085
Total			16,628,993

*Registration date in Hawaii set by presidential proclamation for Oct. 26, 1940.
†Registration date in Puerto Rico set by presidential proclamation for Nov. 20, 1940.
‡Registration date in Alaska set by presidential proclamation for Jan. 22, 1941.
§Final results are not available in time for this publication; however, the Bureau of the Census estimate for Alaska is 8,500.

In each state, boards of appeal were created; one for each 70,000 registrants. These boards of appeal were comprised of not less than five members representative of the various elements and activities in their area. They included one member from labour, one from industry, one physician, one lawyer and where applicable, one member from agriculture. A total of 280 boards of appeal were created to serve the continental United States, together with 1 for Hawaii and 1 for Puerto Rico. These boards of appeal had jurisdiction to review any decision concerning the classification of a registrant by any local board after an appeal had been filed with the local board. They might affirm, modify or reverse the decision of the local board. The decision of the board of appeal was final, unless modified or reversed by the president of the United States.

In each state, the governor created advisory boards for registrants. These boards usually comprised three or more lawyers. Their function was to advise and assist registrants. The governors also created medical advisory boards usually consisting of internists; eye, ear, nose and throat specialists; orthopaedists; surgeons; psychiatrists; clinical pathologists; radiographers; and dentists. These boards assisted the local boards to decide questions of a registrant's physical fitness when the local examining physician was in doubt.

Table II.—*Local Boards*

State	Number of Local Boards	Members on each Local Board	Total Local Board Members	State	Number of Local Boards	Members on Each Local Board	Total Local Board Members
Alabama	155	3	465	New Hampshire	20	3	60
Arizona	25	5	125	New Jersey	202	3	606
Arkansas	94	3	282	New Mexico	36	3	108
California	284	5	1,420	New York	540	3	1,620
Colorado	76	3	228	North Carolina	152	3	456
Connecticut	65	5	325	North Dakota	55	3	165
Delaware	10	3	30	Ohio	330	5	1,650
Dist. of Col.	25	5	125	Oklahoma	105	3	315
Florida	103	3	309	Oregon	57	3	171
Georgia	187	3	561	Pennsylvania	422	3	1,266
Idaho	48	5	240	Rhode Island	29	3	87
Illinois	358	3	1,074	South Carolina	83	3	249
Indiana	152	3	456	South Dakota	67	3	201
Iowa	120	3	360	Tennessee	133	3	399
Kansas	126	3	378	Texas	349	3	1,047
Kentucky	165	3	495	Utah	38	3	114
Louisiana	94	3	282	Vermont	18	3	54
Maine	31	3	93	Virginia	153	3	459
Maryland	66	3	198	Washington	76	3	228
Massachusetts	173	5	865	West Virginia	90	3	270
Michigan	192	3	576	Wisconsin	134	5	670
Minnesota	137	3	411	Wyoming	23	3	69
Mississippi	100	3	300	Hawaii	25	3	75
Missouri	175	3	525	Puerto Rico	122	5	610
Montana	60	3	180				
Nebraska	105	3	315	Totals	6,403		21,621
Nevada	18	3	54				

Members of the advisory boards, appeal boards and local boards, together with the examining physicians and government appeal agents were all voluntary workers. They served their country without compensation. They numbered almost 200,000.

After Registration Day.—The day following registration day the registrars sent the registration cards which had been entrusted to them to the local board nearest each registrant's home address. Each local board then began the process of sorting and numbering its cards. After examining the cards to ensure that all belonged to men in its local board area, each local board shuffled its cards and then gave each card a serial number. The first card received serial number 1; the second card, serial number 2; the third card, serial number 3 and so on. When the serial numbering process had been completed, each of the more than 16,000,000 men who were registered, had been assigned a serial number.

Table III.—*Appeal Agents, Boards of Appeal and Medical Advisory Boards*

State	Government Appeal Agents	Boards of Appeal	Medical Advisory Boards*	State	Government Appeal Agents	Boards of Appeal	Medical Advisory Boards*
Alabama	155	6	14	New Hampshire	20	1	10
Arizona	25	1	2	New Jersey	202	11	13
Arkansas	94	3	17	New Mexico	36	1	4
California	284	20†	21	New York	540	26	53
Colorado	76	2	4	North Carolina	152	7	6
Connecticut	65	5	5	North Dakota	55	1	4
Delaware	10	1	4	Ohio	330	9	18
District of Columbia	25	1	1	Oklahoma	105	4	4
Florida	103	5	5	Oregon	57	3	10
Georgia	187	6	10	Pennsylvania	422	11	11
Idaho	48	1†	10	Rhode Island	29	1	4
Illinois	358	15	32	South Carolina	83	3	12
Indiana	152	12	12	South Dakota	67	1	10
Iowa	120	5	9	Tennessee	133	6	6
Kansas	126	4	17	Texas	349	12	30
Kentucky	165	6	12	Utah	38	1	7
Louisiana	94	5	9	Vermont	18	1	6
Maine	31	3	2	Virginia	153	4	43
Maryland	66	4	8	Washington	76	4	17
Massachusetts	173	7	15	West Virginia	90	4	17
Michigan	192	19	19	Wisconsin	134	10	18
Minnesota	137	5	9	Wyoming	23	1†	4
Mississippi	100	6	15	Hawaii	25	1	1
Missouri	175	7	20†	Puerto Rico	122	3†	4
Montana	60	1	13				
Nebraska	105	3	7	Totals	6,403	280	616
Nevada	18	1	12				

*There are a total of approximately 18,000 examining physicians throughout the U.S.A. However, there is no point in making State by State breakdown of this figure because it continually changes due to the addition of temporary examining physicians from time to time to meet changing demand for this type of service. Registrants' Advisory Boards are in the same category, being appointed as circumstances demand.
†Approximately.

Each local board then prepared a "List of Registrants." At the top of the list was serial number 1 and the name of the man whose card received serial number 1, next was serial number 2 and the name of the man whose card received serial number 2, and so on. The local board next posted its list of serial numbers and names for public inspection in or near the local board. A copy was sent to state headquarters and copies were made available for the press and radio news agencies.

In each local board area there was a man who held serial number 1; another, serial number 2; and so on up to a serial number equal to the number of men registered in the particular board. A local board with 125 registrants had serial numbers from 1 to 125; one with 6,125 registrants had serial numbers from 1 to 6,125.

National Selective Service Lottery.—While this process of serial numbering was nearing completion, Director Dykstra announced that the National Selective Service lottery would be held on Oct. 29, 1940. There were 9,000 opaque capsules filled with individual cardboard slips, bearing the numbers 1 to 9,000. The goldfish bowl which was used in the draft lottery of 1917 was loaned by Independence Hall, Philadelphia, where it was on display. Colonel Charles R. Morris, who arranged the 1917 lottery, and blindfolded Secretary Newton D. Baker for the drawing in the war of 1914–18, was invited to Washington to help with the arrangements. Through the co-operation of Administrator John M. Carmody of the Federal Works agency, the departmental auditorium on Constitution avenue in Washington, D.C., was made ready for this historic event.

Telegraph, telephone and teletype lines were installed; lines from all the radio networks were carried into the building; platform and stands were erected for movie, news reel and news photo cameramen. At 10.30 on the morning of the lottery, the 9,000 capsules containing the numbers were brought to the auditorium from the treasury department vault where they had been under guard to avoid tampering or loss. Before the assembled news men, radio men, cameramen and Washington officials, the capsules were poured and stirred into the historic goldfish bowl which stood on a table at the front of the stage.

Long before noon, the huge auditorium was packed with government officials, diplomats and spectators. A few minutes before 12, President Roosevelt's car stopped in front of the auditorium where a guard of honour of American war veterans had massed the colours. The president's car turned into the driveway and at high noon the chief executive appeared on the stage of the auditorium, surrounded by members of his cabinet and high ranking army and navy officials. Director Dykstra stepped to the microphone and said simply: "Ladies and gentlemen, the president of the United States."

Said the president: ". . . only the strong may continue to live in freedom and peace. . . . In the considered opinion of the congress of the United States, this Selective Service provides the most democratic as well as the most efficient means for mustering our manpower." Immediately following the president's address, Secretary of War Stimson stepped forward to the capsule-filled goldfish bowl and was blindfolded by Colonel Charles R. Morris. Digging deeply into the bowl, Secretary Stimson drew forth a capsule. It was opened and the cardboard slip was given to the president. The president announced: "The first number drawn in the Selective Service lottery is 158."

By telegraph, telephone and radio the number was flashed to every corner of the country in a matter of seconds.

Secretary of the Treasury Morgenthau drew the second number, which was 192; Attorney-General Jackson, the third, 8,239; Secretary of Navy Knox, the fourth, 6,620; Federal Loan Administrator Jesse Jones, the fifth, 6,685. After Jesse Jones had drawn the fifth number, the president left the auditorium and the drawing continued in the mechanical routine manner for 17 hr.

Every precaution was taken by selective service officials to minimize the chance of error and to assure the U.S.A. that no possible mistake would pass by unnoticed. The capsules were completely opaque and of sufficient length to make it unnecessary to fold the numbered slips. Each number, as it was drawn, was read aloud. The numbered slip was then photographed with a watch which showed the second, minute and hour of the drawing. This photograph also recorded the sequence or order in which the number was drawn. The numbered slip was then mounted with adhesive on a master sheet which held 250 numbers in the order of drawing. As each sheet was filled, it was photographed and rushed to the government printing office. There the sheet was reproduced by a photo offset process and the true photographic copy was sent to each local board. By this method, confusion resulting from error in typesetting was completely eliminated.

The tension of the audience eased as the "guest pickers" gave way to trained teams of government employees who did the bulk of the drawing. Numbers were drawn at a fast, steady pace—12 per minute, or roughly 700 an hour (500 was the average rate). Throughout the night the process continued. Numbers became as much a singsong as the feet of marching men.

Drawing and tabulating the 9,000 numbers was an exhausting task. Clerical employees worked in shifts, on duty for two hours, resting for four hours. Army cots were provided in the basement. At last, at 5.47 A.M., Brig. General Lewis B. Hershey, deputy director of Selective Service, drew the last capsule (no. 2,114) from the glass jar. The entire procedure had required 17 hr., 31 min.

After the Lottery.—The 9,000 numbers that had been put into the bowl had, as a result of the lottery, been rearranged in an accidental sequence known as the national master list. This national master list was sent to every state headquarters and local board throughout the country.

Upon receiving the national master list, the local board proceeded to give each registrant an order number. The greatest care was exercised in the assignment of these order numbers, because the order numbers established the order in which registrants were to be selected for service.

The registrant whose serial number appeared at the top or nearest the top of the national master list, received order number 1. The registrant whose serial number was next closest to the top, received order number 2. The registrant whose serial number was third closest to the top of the list, received order number 3, etc., until each registrant had an order number.

Order numbers were assigned in sequence; no order numbers were skipped. Serial numbers appearing on the national master list which were not held by any registrant of a particular local board, were simply crossed off the national master list and ignored.

The first step in the process of order numbering was the elimination of those serial numbers on the national master list which did not apply to the particular local board. The remaining serial numbers on the national master list were then paired with the proper order number.

For example, the national master list began:

Serial number 158
serial number 192
serial number 8,239
serial number 6,620
serial number 6,685
serial number 4,779

These were the first 6 serial numbers drawn in the lottery, arranged in the order in which they were drawn. Suppose that a certain local board's largest serial number was 4,780, because only 4,780 men were registered in that particular local board area. Thus: serial number 158 got order number 1; serial number 192 got order number 2; serial number ~~8,239~~ (eliminated); serial number ~~6,620~~ (eliminated); serial number ~~6,685~~ (eliminated); serial number 4,779 got order number 3.

When the local board was sure that its assignment of order numbers was correct, it entered the order numbers on the registration cards in red ink in the place designated. Thus, when this order numbering process had been completed, the more than 16,000,000 registrants in more than 6,400 local boards had been arranged in a new and accidental sequence that determined the order in which each man would be considered for service by his local board. (*See* also under various states.)

Table IV.—*Men Inducted in the First Call, by Areas*

First Corps Area	
Connecticut	219
Maine	80
Massachusetts	532
New Hampshire	41
Rhode Island	81
Vermont	31
Second Corps Area	
Delaware	120
New Jersey	1,240
New York	3,800
Third Corps Area	
District of Columbia	51
Maryland	157
Pennsylvania	770
Virginia	122
Fourth Corps Area	
Alabama	447
Florida	341
Georgia	412
Louisiana	492
Mississippi	411
North Carolina	513
South Carolina	195
Tennessee	472
Fifth Corps Area	
Indiana	395
Kentucky	172
Ohio	996
West Virginia	155
Sixth Corps Area	
Illinois	828
Michigan	627
Wisconsin	278
Seventh Corps Area	
Arkansas	155
Minnesota	353
Iowa	222
Kansas	157
Missouri	437
Nebraska	122
North Dakota	64
South Dakota	66
Eighth Corps Area	
Arizona	147
Colorado	182
New Mexico	140
Oklahoma	444
Texas	1,573
Ninth Corps Area	
California	1,127
Idaho	58
Montana	70
Nevada	18
Oregon	83
Utah	64
Washington	173
Wyoming	31
Total	19,070

Classification. —Beginning with the man holding order number 1, and following the numerical sequence of order numbers, the local board then began to mail questionnaires to its registrants at the rate of not more than 50 each day. Five days were allowed for the return of this questionnaire to the local board. On the basis of the information contained in the questionnaire, the local board then began to classify each man in one of the following classes:

Class I–A: Available; Fit for general military service. In class I–A are placed registrants who, after physical examination, are found fit for general military service.

Class I–B: Available; Fit only for limited military service. In Class I–B are placed registrants who, after physical examination, are found fit for only limited military service.

Class I–C: Available; Member of land or naval forces of the U.S. In Class I–C are placed registrants who are or who by induction or enlistment became a member of our land or naval forces.

Class I–D: Student fit for general military service. Available not later than July 1, 1941. In Class I–D are placed college or university students who, after physical examination, are found fit for general military service.

Class I–E: Student fit for only limited military service. Available after July 1, 1941. In Class I–E are placed college or university students who, after physical examination, are found fit only for limited military service.

Classification in Class I–A, I–B, I–D, or I–E is made only after examination by the local board's examining physician.

Class II–A: Man necessary in his civilian activity. In Class II–A are placed registrants found to be necessary men in industry, business, employment, agricultural pursuits, government service, or any other service or endeavour or in training or preparation therefor, the maintenance of which is necessary to the national health, safety or interest in the sense that it is useful or productive and contributes to the employment or well being of the community or the nation.

Class III–A: Man with dependents. In Class III–A are placed registrants upon whom one or more dependents rely for support in a reasonable manner.

Class IV–A: Man who has completed service. In Class IV–A are placed registrants who have completed the required military service.

Class IV–B: Official, deferred by law. In Class IV-B are placed registrants who are officials, specifically deferred by law.

Class IV–C: Nondeclarant alien. In Class IV–C are placed registrants who are aliens and who have not declared their intention to become citizens of the United States.

Class IV–D: Minister of religion or divinity student. In Class IV–D are placed registrants who are regular or duly ordained ministers of religion or who are students who are preparing for the ministry in the theological or divinity schools, recognized as such, for more than one year prior to the date of the enactment of the Selective Service act.

Class IV–E: Conscientious objectors. In Class IV–E are placed conscientious objectors who are available only for civilian work of national importance.

Class IV–F: Physically, mentally or morally unfit. In Class IV–F are placed registrants who are found to be physically, mentally or morally unfit for military service; habitual criminals, or persons convicted of treason, or any crime which under the laws of the jurisdiction in which they were convicted, is a felony and under which the local board determines the registrant morally unfit for service.

Registrants who claim to be conscientious objectors had to substantiate their claims in a special form of questionnaire. In the case of registrants claiming to be conscientious objectors, the local board proceeded in the ordinary course to classify them upon all other grounds of deferment and had to investigate and pass upon their claim as a conscientious objector only if, after physical examination, except for their claim of conscientious objection, they would be placed in Class I–A, I–B, I–D or I–E.

If the local board found that the registrant who was placed, after physical examination, in Class I–A, I–B, I–D or I–E, and who claimed to be a conscientious objector, was by reason of his religious training and belief conscientiously opposed to combatant service in which he might be ordered to take human life, but was not conscientiously opposed to noncombatant service in which he could contribute to the health, comfort and preservation of others, the local board determined that the registrant was available for noncombatant service only. The local board indicated this by placing an "O" after the letter indicating his subclass. For example: Class I–A–O, or I–B–O.

If the local board found that a registrant who, but for his conscientious objection to both combatant and noncombatant service would have been placed in Class I–A, I–B, I–D or I–E, was by reason of his religious training and belief opposed to both combatant and noncombatant service, he was placed in Class IV–E. Registrants in Class IV–E were liable for service in work of national importance under civilian direction only.

Induction. —As a result of the classification process, each local board had a pool of men classified in class I–A (fit for general military service). Early in Nov. 1940, the war department issued its first call for men to be inducted through the selective service process. The total number of men inducted in the first call was 19,670. This call was apportioned among the states, and the State Selective Service headquarters, in turn, apportioned its quota among its various local boards.

Men were supplied to fill the first selective service induction as shown in Table IV.

Quotas.—The figures in Table IV represented the total inductions during the year 1940 under the Selective Training and Service Act. They were the first of the 800,000 men who would be inducted by selective service by July 1, 1941. The calls issued to the various states were based on estimates.

Subsequent adjustments were to be made in order to conform to that provision of the Selective Training and Service act which provided:

"Quotas of men to be inducted for training and service under this act shall be determined for each state, territory, and the District of Columbia and for subdivisions thereof . . . on the basis of the actual number of men . . . who are liable for such training and service, but who are not deferred after classification, except that credits shall be given in figuring such quotas for residents of such subdivisions who are in the land and naval forces of the United States. . ."

In figuring these tentative preliminary quotas that were used for the initial induction, estimates were made as shown in Table V. The gross quota represents an estimate of the total number of men who would be in U.S. armed forces on July 1, 1941, from the particular state, based on the number of men available for service from that same state. The credits (national guard) represents the total number of men who will be in the national guard on July 1, 1941, from the particular state to which they are credited. The credits (other) represents an estimate of the total number of men who will be in other branches of the armed forces on July 1, 1941, from the particular state to which they are credited. The net quota

Table V.—*Tentative Preliminary Quotas for Initial Induction*

State	Gross Quota	Credits		Net Quota
		National Guard	Other	
Alabama	39,522	3,766	22,045	13,711
Arizona	8,537	1,580	3,859	3,098
Arkansas	27,643	3,650	15,147	8,846
California	116,878	10,740	68,121	38,017
Colorado	17,394	2,490	11,067	3,837
Connecticut	25,013	6,244	10,348	8,421
Delaware	4,205	1,574	1,302	1,329
District of Columbia	11,848	2,528	5,338	3,982
Florida	28,814	3,407	15,037	10,370
Georgia	45,053	5,320	26,941	12,792
Idaho	8,100	2,236	3,910	1,954
Illinois	116,255	12,958	41,074	62,223
Indiana	47,389	5,978	20,324	21,087
Iowa	36,023	5,145	19,140	11,738
Kansas	26,407	4,212	13,807	8,388
Kentucky	41,613	3,502	28,957	9,154
Louisiana	34,356	3,755	15,517	15,084
Maine	11,558	3,363	5,114	3,081
Maryland	26,898	4,270	10,064	12,564
Massachusetts	61,648	12,969	28,123	20,556
Michigan	77,223	7,655	22,286	47,282
Minnesota	38,021	6,351	13,018	18,652
Mississippi	29,614	3,064	12,791	12,759
Missouri	52,420	5,850	22,951	23,619
Montana	8,337	1,508	4,266	2,563
Nebraska	19,549	2,248	10,845	6,456
Nevada	2,007	315	1,068	624
New Hampshire	6,886	2,128	3,179	1,579
New Jersey	60,149	8,766	19,213	32,170
New Mexico	7,553	1,258	3,333	2,962
New York	200,160	25,941	59, 23	114,796
North Carolina	49,424	4,384	29,427	15,613
North Dakota	9,492	2,163	3,928	3,401
Ohio	94,068	11,540	30,031	52,497
Oklahoma	38,735	6,636	22,734	9,365
Oregon	18,190	4,713	10,671	2,806
Pennsylvania	137,974	14,907	61,545	61,522
Rhode Island	10,360	2,933	4,309	3,118
South Carolina	25,804	3,708	16,139	5,957
South Dakota	9,425	1,767	4,133	3,525
Tennessee	40,766	3,976	22,561	14,229
Texas	105,960	11,633	61,114	33,213
Utah	8,605	2,278	4,174	2,153
Vermont	5,319	1,578	2,535	1,206
Virginia	38,883	5,049	24,087	9,747
Washington	28,424	4,725	17,878	5,821
West Virginia	28,253	2,405	17,394	8,454
Wisconsin	43,935	6,372	15,931	21,632
Wyoming	4,587	947	2,593	1,047
United States	1,935,277	256,485*	888,792*	789,000*
Alaska	..	306		..
Hawaii	..	1,958		1,400
Puerto Rico	..	3,793		9,600
Total	..	262,542†	..	800,000†

*Excluding Alaska, Hawaii, Puerto Rico. †Including Alaska, Hawaii, Puerto Rico.

Table VI.—*Voting Provisions of States for Citizens Absent on Military Duty*

	May Not Vote		May Vote		
	No Absentee Balloting	Franchise Withheld	By Absentee Ballot	By Mail	At Station
Alabama			●		
Arizona			●		
Arkansas					●
California			●		
Colorado			●		
Connecticut			●		
Delaware					○
Florida	●[1]				
Georgia			○		
Idaho			●		
Illinois					●
Indiana			●		
Iowa			●		
Kansas				○	●
Kentucky	●[2]				
Louisiana	○[3]				
Maine				○	○
Maryland				○	
Massachusetts			●	○	
Michigan			●		
Minnesota			●		
Mississippi	●[2]				
Missouri				○	
Montana			●		
Nebraska				○	
Nevada				○	○
New Hampshire			●[1]		
New Jersey			●		
New Mexico	●[2]				
New York				●	
North Carolina			○		
North Dakota				○	
Ohio				●	
Oklahoma			●[5]		
Oregon			●		
Pennsylvania					●
Rhode Island			●		
South Carolina	○[2]				
South Dakota				●	●
Tennessee			●		
Texas		○[6]			
Utah			○		
Vermont			○		
Virginia			○		
Washington			●		
West Virginia			●		
Wisconsin			●		
Wyoming			●		

[1]May vote if at home in period between 15 and 3 days before election. [2]May vote if at home on election day. [3]May vote if at home in period between 10 and 2 days before election. [4]For presidential electors only. [5]By proxies. [6]Except National Guards and reserves.

From *Voting in the United States*, The Council of State Governments (Aug. 1940). Information on voting by persons in military service was compiled by the Legislative Reference Section of the Library of Congress.

represents gross quota less the credits. This net quota is the estimated number of men to be inducted by selective service in order to make up the number of men to be supplied by the particular state. (C. A. Dy.)

Medical Aspects.—Through co-operation between the selective service organization and the army medical corps a uniform type of physical examination was developed and uniform standards were applied by the physicians of the selective service boards and those who constituted the induction boards. Those examined were classified into groups: (1) those selected for general service; (2) those selected for special and limited military service and (3) those who, because of physical defects, were unacceptable for any class of military service. A complete record was kept of every man examined on which all minor as well as major defects which might disqualify him were recorded. After the registrant filled out a questionnaire he was examined as to height, weight and chest measurement. Standards and minimum acceptable measurements of height, weight and circumference of the chest are shown in Table VII.

Table VII.—*Mobilization Physical Examination Standards*

Height	Standard		Minimum	
	Weight	Chest measurement at expiration	Weight	Chest measurement at expiration
Inches	*Pounds*	*Inches*	*Pounds*	*Inches*
60	116	31¼	105	28¾
61	119	31½	107	29
62	122	31¾	109	29¼
63	125	32	111	29½
64	128	32¼	113	29¾
65	132	32½	115	30
66	136	32¾	117	30¼
67	140	33	121	30½
68	144	33¼	125	30¾
69	148	33½	129	31
70	152	33¾	133	31¼
71	156	34	137	31½
72	160	34¼	141	31¾
73	164	34½	145	32
74	168	34¾	149	32¼
75	172	35	153	32½
76	176	35¼	157	32¾
77	180	35½	161	33
78	184	35¾	165	33¼

Anyone who fell within these standards was considered suitable for general military service, even one whose weight was greater than the standard indicated for the height, provided the overweight was not sufficient to interfere with military training. The mere fact that a man was overweight would not in itself bar him from military service. Such a man might be accepted for limited or special service, provided he was not otherwise mentally or physically unfit.

The examining board was given much discretion in matters of weight and height. If in its opinion proper food and physical training would make a man acceptable for service, he was likely to be inducted. All of the various standards from a physical point of view were included in the official bulletin which could be secured from the selective service board or from the United States army medical department.

Particularly important in the new regulations was the requirement that a test for syphilis be made on each man examined and that on those positive, another test should be made. Two positive Wassermann tests disqualified a man for military service. This was the first time in the history of any army that such a regulation had been put into effect.

The first official statistics came from 120 local examining boards in New York city and covered 1,643 men. Of these 1,213 were accepted for general military service, leaving 430 rejected or fit for limited duty only. The causes for rejections included 2.7% of the total men examined rejected for underweight or for overweight; two men were rejected for deficient height; several were rejected for deformities of the head and of the spine. Defective vision was the primary cause of rejection of 5%, or 74 men; 1.4%, or 19 men, had ear troubles; .9% had nose and throat troubles. As is usual, teeth and mouth conditions caused more rejections than any other single cause—namely, 5.7% of the total. Of the men examined 4.9 per cent were rejected for heart diseases. As a probable result of infantile paralysis 28 men were rejected, or 1.7% of the total, which was a reflection of the infantile paralysis epidemic in New York of 1916. Foot and leg conditions caused 3.3% rejections and 1% were rejected for tuberculosis. Only 6 men, .4% of the total, were rejected because of syphilis but there were 90 cases of a positive Wassermann test which deferred the men in question until they could be re-examined. Psychiatric problems represented .8% of the total and led to the deferment of 12 mental defectives and one man for nervous instability.

These figures do not indicate that the U.S. is a nation physically unfit. A large proportion of the rejections were for ailments that are minor and easily remediable. In 1917–18 about 10% of the draftees were rejected because of manifest tuberculosis. The mortality from that disease declined 75% in the last quarter century among men of draft ages. The reduction in heart disease mortality among men of these ages was about 40% for white men and 60% for Negroes. The figures developed by the National Institute of Health indicated that altogether 60% of all disabilities would be due to defects of the eye and ear, mechanical defects and conditions of the heart and kidneys. It was estimated that about 140,000 men would be rejected because of tuberculosis.

When the men were sent from the selective service boards to the induction boards, another 25% were rejected. Out of 415 men examined, 315 were found fit for service and 100 were rejected. Even though these men had been passed on by the selective service board, teeth and eyesight in some were still found not to be up to army standards.

Especially important was the difficulty of combing out those who were defective from a mental point of view. In Jan. 1941 a conference was called in Washington by the Federal Security administrator to establish definite standards for the examinations in the field of psychiatry and to do everything that could possibly be done to eliminate cases of potential nervous breakdown among the men selected for military service. (M. Fi.)

Selenium. The bulk of the selenium output of the world is a by-product in copper refining in the United States and Canada; Sweden, the soviet union, Mexico and Japan have some production, but no statistics are available. Production in the United States amounted to 227,100 lb. in 1939, with imports of 124,800 lb. Production in Canada declined to 367,900 lb. in 1939. The chief use is in the glass industry as a decolourizer and as the colouring agent for red or ruby glass; other uses are in pigments, rubber vulcanization and flame-proofing; one of the most promising of the newer uses is the addition of selenium to copper alloys and steels to improve the machinability. (G. A. Ro.)

Senate: *see* Congress, United States.
Senegal: *see* French Colonial Empire.
Serbia: *see* Yugoslavia.
Seychelles: *see* British East Africa.

Shanks, David Carey (1861–1940), U.S. soldier, was born in Salem, Va., April 6. He was graduated from the United States Military academy at West Point in 1884. He rose through various grades until he reached the rank of major general in 1917, and was retired in 1925. He served in the Spanish-American war and in the Philippines and was inspector general of the army in the Philippines in 1917 when the United States entered the World War. He was called

home and put in charge of the embarkation of troops and did his work so well that he received the Distinguished Service medal. He died in Washington, D.C., April 10.

Shasta Dam: *see* DAMS.

Sheep. The 1940 lamb crop in the United States broke all production records, 32,729,000 head, which was 2% over the previous high of 32,157,000 in 1938, about 3% over the 1939 crop of 31,781,000 lambs and 9% over the ten-year (1929–38) average. The percentage of lambs saved per 100 ewes was 87·5%, compared to 86·3% in 1939 and 88·7% the previous peak year, 1938. The number of breeding ewes more than one year old was 37,395,000 at the beginning of 1940, and 36,824,000 in 1939.

Production of Lambs in the United States, 1940 and 1939

	1940	1939
13 range states		
Texas	4,867,000	4,030,000
California	2,474,000	2,630,000
Wyoming	2,292,000	2,335,000
Montana	2,019,000	1,927,000
Utah	1,594,000	1,573,000
Idaho	1,546,000	1,580,000
Oregon	1,453,000	1,513,000
New Mexico	1,369,000	1,320,000
Colorado	1,361,000	1,347,000
South Dakota	1,049,000	957,000
Nevada	564,000	537,000
Washington	546,000	579,000
Arizona	479,000	480,000
11 North Central States	7,924,000	7,732,000
24 Atlantic and South Central States	3,192,000	3,241,000

A pronounced shift in the number of sheep in the different states between 1934 and 1940 was reported in the *National Wool Growers' Journal* of Salt Lake City, Utah, in its Sept. 1940 issue. In that time the number of sheep in California increased 23·5%, and in Texas 22%. Eleven range states, long a stronghold of the sheep industry, decreased by 13%. These states were: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, Utah, Washington and Wyoming. The decline, the *National Wool Growers' Journal* pointed out, was owing partly to a reduction in government grazing permits, but largely because it was more profitable to grow lambs in Texas and California and in 14 farm states where the number of sheep had increased 11·66%. The 14 farm states were: Alabama, Arkansas, Illinois, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Missouri, Nebraska, Oklahoma, South Dakota and Tennessee. In 21 other states the number of sheep declined 8·16%. The sheep industry in 1940 became an object of special wartime interest as the U.S. army and navy munitions board specified wool as a "critical material." On Oct. 10, 1940 the National Defence Advisory commission announced that it had arranged for 250,000,000 grease lb. of British-owned Australian wool to be stored in the United States as a strategic reserve. This reserve, it was announced, had not been purchased. It was to be available, without dislocation of domestic wool markets, only as need might arise. (*See* also LIVESTOCK; MEAT.) (S. O. R.)

Shipbuilding. There are no authentic reports as to world tonnage of commercial shipping built or building during 1940. Merchant tonnage of seagoing vessels under construction in the United States as of Dec. 1 was about 1,529,570 gross tons, to which should be added about 62,000 tons of miscellaneous small craft. United States tonnage delivered during 1940 was about 408,000 tons. Reports indicate that the British output of commercial tonnage for 1940 was in excess of 1,000,000 tons. So far as other European shipyards were concerned it is believed that the output of commercial tonnage was very small and that the efforts of the axis powers were devoted largely to the construction of naval vessels. The output for Japan was assumed to be about the same as for 1939. Monthly reports of tonnage losses from all causes due to the war, plus normal casualties from grounding or weather showed a total loss for all nations of about 4,500,000 gross tons. The net loss of world tonnage, therefore, since the war, was about 3%.

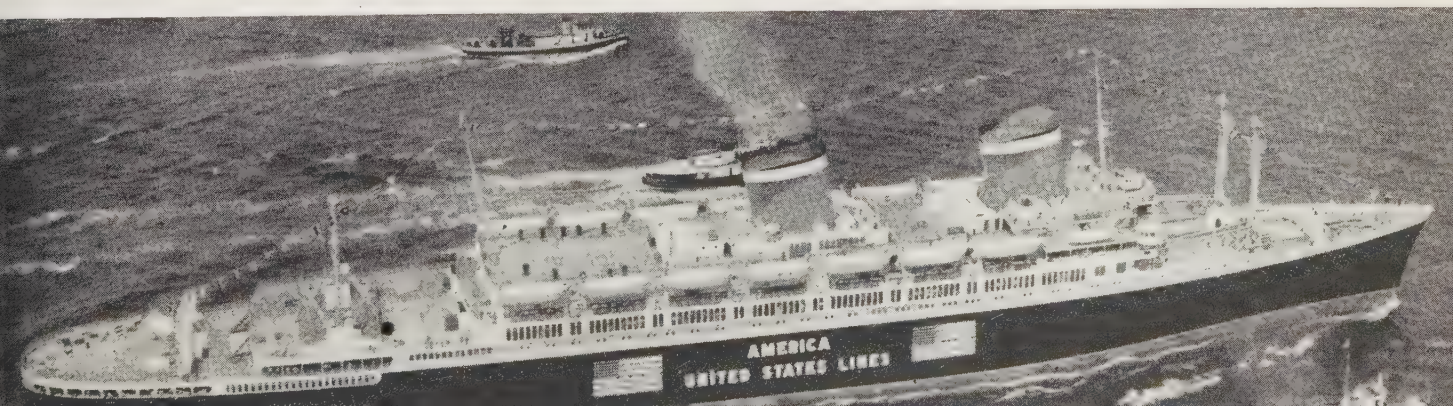
United States.—The demand by Great Britain for commercial vessels was very great, either for existing tonnage or for new construction. Late in December it was announced that a contract had been placed in the United States for the construction of 60 merchant vessels of about 10,000 deadweight tons each for British account, 30 of these vessels to be built on the east coast and 30 on the west coast.

In the United States the increased demand for tonnage to take over the interrupted trade of belligerent nations and to care for its own trade previously handled in foreign vessels, together with the sale of many of the older vessels to foreign governments created a continued demand for new U.S. tonnage, so that the activities of U.S. shipyards in the construction of commercial vessels was greater than at any previous period in peacetime.

The program of the maritime commission since its inception late in 1937 consisted of 179 vessels, of which 83 had been launched and 56 had been delivered to Dec. 18, 1940. One hundred and thirty-seven of these vessels are propelled by steam and 42 by internal combustion engines. The maritime commission's program of 50 commercial seagoing vessels a year for a period of 10 years has so far been considerably exceeded and it seems probable that it will be exceeded for some time to come.

In 1939 it was anticipated that private shipyards in the United States then operating would be able with existing facilities or moderate extensions thereof to handle any merchant or naval program then in sight. Since that time two acts of congress, one on June 14, 1940, providing for an 11% naval increase and a second on July 19, 1940 providing for a further naval increase of 70%, required large extensions of shipbuilding facilities in both navy yards and private shipyards, and brought into being new shipyards for the construction of naval vessels, so that the demand upon the industry in 1940 was greater than at any time in the past with the possible exception of the World War (1914–18) period.

VIEW OF THE "AMERICA," largest liner ever built in the United States, as she entered New York harbour from the builders July 29, 1940



There were in 1940 31 private shipyards in the United States engaged in the construction of seagoing vessels, of which not less than 20 were building naval vessels of various types; others were building merchant vessels only, while some of the 31 were building both naval and commercial vessels.

Employment in the private shipyards and ship repair yards of the United States was in 1940 about 45% in excess of the employment in 1939.

An outstanding event of 1940 in British shipbuilding was the completion of the "Queen Elizabeth" at the works of John Brown and Company, Ltd., Clydebank, Scotland. This vessel arrived in New York on its first trip across the Atlantic on March 7, 1940.

In the United States an outstanding event was the completion and delivery of the "America," the largest merchant vessel ever constructed in the United States. This vessel was designed to operate in the north Atlantic service of the United States lines in conjunction with the "Manhattan" and "Washington." Its main characteristics are: length overall 723 ft., breadth 83 ft. 3 in., draught loaded 32 ft., gross tonnage 24,454, shaft horse power 37,400, normal sea speed under average sea conditions 22 knots.

Fire-resisting material was used in staterooms, public spaces and throughout this vessel and proved conclusively that it is possible to produce pleasing effects with material of this kind, while at the same time adding greatly to the safety of the vessel against fire risks.

The "America" is very effectively subdivided so that any three adjacent water-tight compartments of the ship could be flooded without submerging the vessel beyond the margin line.

The first important contract initiated by the maritime commission after the "America" was by arrangement with the Standard Oil Company of New Jersey under which that company would construct 12 twin-screw vessels with a designed speed of not less than 16½ knots, the commission to pay the cost of national defence features. These vessels are of 11,335 gross tons with a capacity of 145,000 bbl., length 553 ft., breadth 75 ft., draught 29 ft. 10½ in. These vessels have been completed and have operated at better than 18 knots. All of them have been taken over by the navy department.

Of the cargo vessels, the first lot for which contracts were placed were of the C-2 type. They were designed for a maintained operating speed of 15½ knots. Gross tonnage 6,200. Displacement at load draught, 13,876 tons. Cubic capacity 506,911. Length overall 459 ft. Breadth 63 ft. The type of propelling machinery varies with different contracts awarded—some are propelled with turbine reduction gears, some with internal combustion engines (direct drive) and others with internal combustion engines with reduction gears. The shaft horse power of all units is about 6,000. These vessels have given very satisfactory results in operation. The fuel consumption of the steam installation is as low as 0.545 lb. per h.p. per hr.

The second type of vessel is the C-3 class. This design was made to satisfy the demand for vessels of great deadweight cargo carrying capacity and greater speed than the C-2 design. Displacement 17,615 tons, gross tonnage of the steam propelled design 7,770. Shaft h.p. 8,500 and normal sea speed under average sea conditions at load draught, 16½ knots. Cubic capacity 730,550. Fifteen of these vessels had been delivered, were in service and showed good results in operation.

Eighteen of the C-3 type of vessels were being built as combination cargo and passenger carriers. Some of them were designed to carry 96 passengers with 124 officers and crew; others to carry 196 passengers with 155 officers and crew.

The third standardized type of maritime commission vessels is the C-1 design. These vessels were designed to meet the need for efficient, economical cargo carrying on trade routes not requiring excessive speed and where large cargoes might not be continuously available. Displacement at load draught 11,100 tons. Gross tonnage of steam propelled type 5,028. Length overall 413 ft. Breadth 60 ft. Depth molded 37 feet 6 inches. Shaft h.p. 4,000. Normal sea speed under average sea conditions 14 knots. Cubic capacity 451,000. Four of these vessels had been delivered in 1940.

There are some variations in the arrangements of particular vessels of each type to meet the requirements of special services.

The balance of the fleet, aside from additional oil tankers, building under the jurisdiction of the maritime commission consisted of a total of 28 vessels for the American Export Lines, Inc., Seas Shipping company, Mississippi Shipping company and the United States lines. (H. G. S.)

Other Countries.—Except in the occupied countries on the continent, where there was naturally a complete absence of authentic information, shipbuilding in Europe during 1940 followed the indications of 1939 very closely. In Britain there had been no need for any great alteration in the government policy laid down at the beginning of the war, and the greatest effort was in the production of cargo tonnage of the simple-specification tramp class which normally falls into two groups, with speeds of roughly 10 and 12½ knots. Faster ships were not debarred if they could be produced quickly and efficiently. Established shipyards were encouraged to continue building their own specialties, and proved designs were accepted except when they were obviously unsuitable for war purposes, for repeated production.

The output of naval and mercantile tonnage was divided about equally and the British government was hoping that 1940 would beat the peak mercantile figures of the previous war, 1,338,000 gross tons in the year 1918. There was certainly considerably greater output for every man employed, due to improved machinery and layout and the specializing policy of the various yards, but the men themselves were making a magnificent effort and the time kept was better than in peace. There were few exceptions to this, principally in the South Wales repair section, and the men's workmates generally dealt with the matter adequately. The principal check to improved output, which could not be avoided, was the exceptionally bad weather in the early part of the year.

Private shipowners were given permission to place orders provided the plans were approved by the government, but very few of them cared to shoulder the unknown liability of increasing costs, for the builders would not consider contracts at a fixed price, but insisted on the "time and line" basis.

The hulls were generally produced far more quickly than the engines, fully justifying the government's policy of simplifying the machinery as much as possible and doing without such refinements as superheaters although the designs provide for their being installed without difficulty after the war. The diesel engine was not debarred as it was suggested that it would be at the beginning of the war; quite a large proportion of the faster cargo ships, with a speed of about 12 knots, were fitted with it, but the simplest steam engine was preferred where possible both for speed of production and wartime crews. The diesel engine makers were standardizing their cylinder dimensions and other factors as far as possible, simplifying the supply of spares and repair work, and four-stroke cycle engines were fitted with cast-iron propellers instead of bronze.

The organization of repair work was naturally the most difficult part of the industry, with a constant stream of war casualties requiring immediate attention and the ordinary maintenance repairs and overhauls having to be carried out whenever the opportunity arose. Excellent results were shown in most areas, although they were naturally uneven, as some yards had to carry out their work under constant enemy attention while others were almost immune.

This inequality of working conditions made it necessary to prepare a scheme for transferring labour if any yard should be put out of production or if inequality of production were slowing down the main war effort. After the war had been in progress for a year there were still 9,000 registered shipyard workers unemployed, against 30,000 in Sept. 1939, but this figure was taken on a certain day and there are always men idle between repair jobs if a certain reserve of labour is to be maintained. Of the remainder it is probable that the majority were quite unfitted for shipyard jobs under modern conditions, although they had been registered as shipbuilding workmen with the ministry of labour. The national register of men with engineering experience and qualifications who were not employed on war work produced a large number of names, a due proportion going to shipbuilding and marine engineering in which there was a serious shortage of skilled labour.

One of the most striking features of the year was the extraordinary elasticity of British shipbuilding, the steady acceleration of normal work going on without interruption in spite of the urgent demands imposed from time to time by the rapidly changing situation.

Shipbuilding in the axis countries was proceeding with the greatest secrecy. There was every reason to believe that in Germany the effort was mostly concentrated on men-of-war, principally submarines, destroyers and escort craft, for the country had at its command sufficient tonnage for the small cargo movement in the Baltic and along occupied coasts. Japan had radically curtailed its shipbuilding efforts, largely centred on the tramp class in which the Chinese operations had revealed a serious shortage; and before the treaty with Germany and Italy was signed, and the supplies of scrap metal from the United States were stopped, there was every evidence that the lack of steel was very serious, for the government permits for its release were only being honoured for about half the amount mentioned.

The complete stoppage of news concerning the shipbuilding industries in the occupied territories suggested that their facilities were being used by the Germans for the production of the types which they required, but the shipyards in Denmark and Holland, although among the finest of their class in the world, were not laid out for the rapid production of warships of any type. In Italy the shortage of steel would seem to have been felt even more than in Japan.

The shortage of tonnage offered an opportunity to establish the shipbuilding industry in Australia, where it had been planned for some years past. The Broken Hill Proprietary Ltd. started building warships and merchantmen at Whyalla; and in other centres where materials were readily available preparations were being made to build merchant ships up to 12,000 tons. The cost of Australian labour is high for the value of the ships in normal circumstances, but it was hoped to establish the industry while war conditions made price a secondary consideration. (F. C. Bo.)

Shipping, Merchant Marine.

The dislocations to American shipping brought about by the war in Europe continued to be the most important fact affecting the United States merchant marine during 1940. The Pittman Neutrality act, which became a law Nov. 4, 1939, barred

seven lines employing 86 ships from their customary routes in the north Atlantic; and the extension of this law to cover the Mediterranean area in June 1940, after Italy had entered the war, resulted in the discontinuance of the Mediterranean operations of 28 vessels operated by four lines. During the balance of 1940 all of these vessels were put into service again through sale, charter or rerouting.

Lykes Bros. Steamship company increased its far eastern service from 8 ships to 20 ships. American Export lines added 4 vessels to its Indian service, making 9 in all. The American President lines continued its far eastern services on a weekly basis, and the first of its large new cargo-passenger vessels, the "President Jackson," went into service toward the end of the year.

The Puget Sound-Orient line was transferred by the maritime commission to private ownership during 1940. This line, which runs from Puget sound to the far east, is called the American Mail line. It operated 6 vessels in 1940. The American Pioneer line's Indian service, with the 4 vessels operating in that service, was sold to American Export Lines, Inc., late in 1939. Its far east, Atlantic and Gulf-Australian services were sold to the United States lines in Feb. 1940 and at the same time the 12 vessels which had been operated by American Pioneer in those services were chartered to United States lines.

In Latin America the American Republics line had 22 vessels in the east coast service. The Pacific Republics line, formerly the Pacific Argentine Brazil line, operated 4 vessels from the west coast of the United States to the eastern coast of South America. The Mississippi Shipping company added 3 ships to its Gulf-east coast of South America service, making a total of 10 in all under its flag.

To the west coast of Latin America the Grace line ran 9 vessels from the east coast of the United States and 7 from the west coast. It also had 6 vessels in service from the east coast of the United States to the Caribbean islands and the north coast of Latin America.

A marked increase in the sailings of the Isthmian Steamship company was noted, due to the withdrawal of much competing foreign flag tonnage and to a substantial increase in movements of various types of cargo. The Ocean Dominion Steamship company, which changed its name to the Alcoa Steamship company, purchased 8 new vessels from the maritime commission for service to the Caribbean islands and the Guianas. As a result of the increased tempo of the maritime commission's construction program, 179 ships were contracted for as of Dec. 1. Eighty-five of these had been launched, and of these 85, 55 were in service as of the same date.

The navy during the year 1940 acquired 12 twin-screw national defence tankers, and 11 other vessels built under the maritime commission's program for use as cargo and ammunition carriers, seaplane and submarine tenders, transports, etc. It also bought 14 older cargo ships, and about 100 smaller boats for trawlers, etc. The requirements of the navy for new cargo vessels, as well as for warships being built under the two-ocean navy program, served to keep every active American shipyard full to capacity throughout the year.

The sale of over-age American merchant vessels to Great Britain, Canada and other countries reached a high figure during the year. A total of 338 ships of all types, of 1,211,998 gross tons, were sold to alien purchasers during the period Sept. 1, 1939–Dec. 1, 1940. Of these, 130 of 470,732 gross tons were sold to British purchasers; 42 of 60,259 gross tons were sold to Canadian purchasers; 28 of 117,906 gross tons to French and Belgian buyers. The sale of these over-age vessels, while it did not interfere with the operations of U.S. vessels in foreign trade, did cause shrinkage in certain coastwise services. Some coastwise lines suspended operations entirely, including the Moore-mack Gulf line and the Lykes Gulf line; and the services of other lines were somewhat contracted.

The regulatory powers of the maritime commission over continental coastwise and intercoastal shipping were, under the Transportation act of 1940, transferred to the interstate commerce commission as of Jan. 1, 1941. No drastic changes in regulatory policies were envisaged as a result of this transfer.

The charter market continued high during the early months of 1940, reaching its low point in June with the shutting off of the Mediterranean to United States vessels. After July a steady increase in charter demands took place, and in December the market was as high as at the first of the year. Many vessels of foreign flags, including Norwegian, Swedish, Yugoslavian and Panaman, were chartered to American operators.

Freight rates also went up during the year, from 10% to as much as 100% in some cases. Most marked increases were noted in commodities which used to travel in tramps, since practically all tramp shipping was withdrawn as a result of the war.

War risk insurance was in effect on nearly all United States vessels in foreign trade, thus increasing cost of operations measurably. The maritime commission made substantial progress in its training program for licensed and unlicensed seamen and apprentices. Including special national defence classes in radio, visual signalling and gunnery, over 10,000 officers, cadet officers, cadets, unlicensed personnel and apprentices chosen from the CCC camps were being trained by the end of 1940.

Repatriation of American nationals in Europe continued during the early part of the year. Three specially assigned United States lines vessels were sent to a French port and to Galway during June and July to aid Americans in returning home. At the end of the year the only American services going to Europe were the American Export lines, with Lisbon, Portugal, as their only European port, and the United States lines, which operated an occasional freighter to Vigo, Santander, Gijon and Bilbao, Spain. The state department, the maritime commission and ship operators arranged for the return of American nationals in the far east in the fall of 1940, and three special voyages were made by United States ships to bring back stranded citizens. The American President lines continued its fortnightly service from the orient and, after the original rush, was able to handle the requirements of home-coming Americans.

On the Great Lakes cargo shipments were heavier than ever, and the ore-carrying lines had the best year in their history. Most

UNUSUAL CLOSE-UP PICTURE of a German air attack on British shipping in the English channel July 26, 1940. The two merchant ships are untouched, but the escorting destroyer at the right has possibly been damaged

THE "QUEEN MARY," docked at New York city since Sept. 4, 1939, sailed for an unannounced destination March 21, 1940. Five weeks later she was seen at Cape Town, South Africa

of the trade consisted in carriage of iron ore from the head of the lakes to Lake Erie, and coal on the return voyage.

The first American vessel to be a victim of the war was the "City of Rayville," which was sunk on Nov. 8 off the coast of Australia. All but one of the crew were saved. The man who was lost was Mac B. Bryan of Randleman, N.C., who was third assistant engineer. (E. S. L.)

Europe.—In 1940 all the merchant shipping in the world was naturally operating entirely under war conditions, which were felt even in the safest trades far away from the actual area of operations, and these conditions made business exceedingly difficult. As was the case in the War of 1914–18, German merchant shipping was immediately restricted to the shorter routes round their own coasts, and that only at heavy expense for protection. The same thing later applied to Italy. A certain number of vessels managed to evade the blockade and make their way to German ports, but the value of their effort was principally for propaganda.

As far as the British merchant navy was concerned, the most interesting feature of the year's history was the agreement as to rates of hire by the ministry of shipping, which was announced in the house of commons in April after payments on account had been made since the beginning of the war. This agreement was only reached after long discussions and covered the deep sea tramps and liners.

The agreement is a long one and it is only possible to give the principal features. For tramps it arranged a basic rate, with variations for special circumstances. The basic rate as from March 1 was on a sliding scale, varying from 6*s*. per ton per month for ships of over 8,000 tons deadweight to 8*s*. per ton per month for ships of from 5,000 to 5,250 tons. For the period before March 1 the rate varied from 5*s*.7*d*. to 7*s*.7*d*. on the same scale of tonnage.

In the case of deep sea liners the basic rate was intended to cover the normal running costs, plus 10% of the first cost of ships built since 1922 to cover 5% depreciation and 5% return on capital. In their case the basic rates vary from 13*s*.7*d*. per gross ton per month for passenger liners of 18 knots and over with white crews, to 7*s*.7*d*. per gross ton per month for cargo liners with Asiatic crews. In all cases there was an extra shilling per month for motorships.

Coasting tramps secured what were regarded as rather better terms shortly after the main agreement was published, but the important question of tankers was still left under discussion and the coasting liners were excluded although their normal trade was particularly hard hit by conditions and they made several appeals to be brought under the requisitioning scheme.

Neutral ships were naturally paid infinitely higher rates than the British requisition scale, but when the German invasion of Norway, Holland, Belgium and Denmark, and the collapse of France gave Britain the services of a large number of ships the high rates enjoyed by neutral shipowners immediately declined and a number of the cargo ships were laid up, although those fitted with passenger accommodation were fully utilized. The Allied ships in British service continued to be paid very much higher rates than the ministry of shipping scale.

The ministry of shipping published a review of the position after a year of war, when it was shown that the tonnage added to the British flag had appreciably exceeded the losses. The latter have been published weekly, divided into British, Allied and neutral; Norwegian tonnage counted as neutral from the outbreak of war until April 9 and Belgian and Dutch ships until May 10, when they were classified as Allied. During the period the axis war against shipping succeeded in destroying 396 British ships of 1,561,193 tons gross, 98 Allied ships of 455,854 tons gross and 255 neutral ships of 778,948 tons gross, a grand total of 749 ships of 2,795,995 tons. Against this the British merchant navy was increased by just over 2,000,000 tons of shipping—new ships delivered, ships purchased from neutral countries (principally Panama and the United States), ships captured from the enemy and ships pre-empted from the Danish flag after the invasion and the French flag after the collapse, which otherwise would have been used by Germany against Britain.

In addition there were, at that time, about 750,000 tons of neutral shipping on time charter, principally of the tramp class. Quite apart from the ships actually flying the British flag there were between 6,000,000 and 7,000,000 tons of Allied shipping—Norwegian, Belgian and Dutch—of which by far the greater part was assisting in the British war effort. Against these satisfactory figures, however, should be placed the facts that convoy delays cause a serious waste of tonnage and that difficulty in getting repairs and overhauls promptly executed means a further delay, especially in the tanker class.

Apart from delays, full weight must also be given to the fact that the practical closing of European sources of supply forced ships on national service to make very much longer voyages, so that, in spite of the exclusion of all but essential cargoes, the situation was still serious and the greatest care had to be taken to utilize every ton of space. A number of passenger liners which would normally lift large quantities of parcels cargo were in government service as auxiliary cruisers and transports, which also had to be considered.

Apart from this there is no doubt that the German plans for the destruction of British commerce had signally failed, although it is not pretended that the losses were not serious. The original German war plan covered the destruction of 2,000,000 tons of British shipping in the first month of war; this was not achieved in a year, and in the first four months, when the element of surprise was greatly in favour of the submarines and minelayers, the result, including neutrals, was less than one-third the amount estimated for four weeks.

The other side of the account, German and Italian losses, is admittedly incomplete, for the British government's policy is to include only those ships which are definitely known by name to have been destroyed, and to exclude from the return all "moral certainties" or "probabilities." Yet the Germans were known definitely to have lost, in the first year of operations, 129 ships of 644,155 tons and the Italians 41 ships of 222,528 tons, the latter having had the great advantage of being able to get the majority of their ships into safe positions before they declared war. Of these, 58 German and 29 Italian ships were captured and put into Allied service, a large proportion of the remainder having been scuttled to avoid capture. This practice led to a very important case in the courts of law (the King's Bench Division) when it was decided that British cargo lost in scuttled ships did not come under the ordinary pre-war marine policy.

A large number of German with many Italian and a few neutral and French ships had been sheltering in neutral ports rather than run the risk of a sea voyage; some German ships had slipped out to run the blockade back to Germany and some in order to supply raiders, but the number which had succeeded in their object was small.

The invasion of Norway by Germany gave to the British service practically the whole of the huge Norwegian tanker fleet, the third largest in the world, at a time when it was most needed. Against all pre-war calculations, oil fuel had been easier to obtain and no dearer than coal although more coal was available for bunkers when the French market collapsed. This did not, however, make as much difference as it might have done, for distribution has always caused far more trouble than production.

The prize ships, those purchased from foreign flags, and those secured from Denmark and France, were registered in the ownership of the ministry of shipping, but placed under experienced firms for management. In the case of Danish ships these managers were often British-flag firms intimately connected with the original owners.

In view of the very strict control of all tonnage, and the profits of all shipping companies, the second-hand market was practically dead.

Apart from the purely neutral routes which are largely covered by American tonnage, and the British charters mentioned, there was very little business for free tramps and most of it was in connection with the supply of foodstuffs to such countries as Spain and Switzerland. The majority of the neutral tramps which found business were on time charter rather than voyage; when business was arranged on the latter basis the rates appeared high compared with pre-war levels, but in many cases they did not meet the increased running costs and insurance. Practically, the profitable voyage charter business was ended when the United States government placed its embargo on the export of scrap to Japan, for which business there had been a good demand at a fair price which had generally been accepted by Scandinavian or Greek ships.

Neutral shipping, except that deliberately attempting to supply the axis powers, suffered very little inconvenience from the navicert system of economic control which was made to work very smoothly and which was generally honoured. In September it was, however, necessary to reimpose the Black List which was so effective at the end of the late war and a number of Yugoslav, Turkish, Greek and other steamers, mostly of very advanced age, were placed upon it.

Under pressure from Germany, the Vichy government published a plan for the future of French shipping which provided for the abolition of luxury liners and concentration on cargo liners of fair size and speed. The French shipping community naturally objected to it as it would give the cream of the post-war business to Germany, while the general public was as indignant as it dared to be at the obvious intention of diverting the American tourist business away from France. As far as published German and Italian intentions were concerned, the plans were those laid down before the war, with the addition of prize ships.

In consequence of the number of ships sunk by submarine, mine and air bomb, the British ministry of shipping tightened up the life-saving regulations, especially in matters of detail concerning the equipment of life-boats which had been very generally adopted without government regulation, and the acceptance of various life-saving devices which had been put on the market. All ships built for the government were being equipped with motor life-boats, but although the practice was strongly recommended, problems of supply made it impossible to lay down a definite rule for vessels which were already built. The provision of new davits is an important factor and the acknowledged fact that a motor life-boat whose engine will not work is of far less value than an efficient pulling boat, had to be taken in conjunction with the shortage of trained engineers who would, in addition to their normal work in the engine room, be able to keep these life-boats in good running order. (*See* also BLOCKADE; INTERNATIONAL TRADE; NEUTRALITY; SHIPBUILDING; STRATEGY OF THE EUROPEAN WAR; SUBMARINE WARFARE; UNITED STATES.) (F. C. BO.)

Shock Treatment: *see* NERVOUS SYSTEM; PSYCHIATRY.

Shoe Industry. War and defence measures, the world over, interfered with the progress of shoes and leather. Future implications were that reduced production, control of types of shoes and a limitation of price and use would come to pass in 1941.

Even U.S. shoemaking declined but not for the same reason. Shoe production in 1940 reacted from the high level reached in 1939. The Jan. 1, 1941 position of the trade was short inventory, a rapid buying bulge and an extra production in the field of men's shoes, covered by army and navy demands, tremendously increased because of the U.S. trainee policy for defence.

World Trading.—Limited to cargo bottoms, the movement of millions of hides and skins was seriously curtailed. Nations at war could not get the heavy leathers, and nations at peace either could not afford the leather or relied upon domestic supply. Normally, 250,000 hides and skins are imported into the United States every working day of the year. Kid skins—99·9%—continued to flow in. The fine calfskin market of middle Europe was closed completely. The novelty skins—kangaroo, crocodile, etc.—were available, though subject to shipment delay. The cattle hide demand was greater than the U.S. take-off, so Argentine hides came to the U.S. market but the U.S. could not consume the world surplus accumulated there.

Comparative Statistics of U.S. Shoemaking, 1930 and 1940

Year	Women's	Men's	Misses' and Children's	Youths' and Boys'	Infants'	All Other	Total
Production of Shoes by Major Types (000's omitted)							
1930	114,963	77,406	32,037	18,530	18,558	42,676	304,170
1940*	165,877	101,845	39,799	14,801	21,723	54,020	398,065
Per Capita Production of Shoes by Major Types (Pairs per capita)							
1930	2.68	1.76	2.63	1.48	1.62	0.35	2.47
1940*	3.42	2.07	3.15	1.14	2.55	0.41	3.02
Estimated Consumption of Shoes by Major Types (000's omitted)							
1930	129,341	85,381	35,727	20,762	21,154	43,762	336,127
1940*	175,329	102,418	41,654	15,780	22,905	54,213	412,299
Estimated per Capita Consumption of Shoes by Major Types (Pairs per capita)							
1930	3.01	1.94	2.93	1.66	1.84	0.36	2.73
1940*	3.61	2.08	3.30	1.22	2.68	0.41	3.13

*Preliminary

World Production.—Machine-made production in 1940 was reduced considerably because civilian use was secondary to military use and the nationals were expected to wear what they had. Nevertheless, even in belligerent lands footwear fashion found new expression in men's, women's and children's shoes.

Rubber Footwear.—Rubber boot, galosh, shoe and sandal manufacture showed a high record of production in 1940. War wear first, protection against the elements increased the manufacture and the quick consumption of rubber protective footwear. And because certain types of wearables can be finished more cheaply with rubber-moulded bottoms, there was an immense increase in lightweight civilian rubberized footwear the world over. (A. D. AN.)

Shows. **Horses.**—The American Horse Shows association in its annual list of horse shows in the United States scheduled 162 horse shows held in 1940. Of these 127 were by organizations that were members of the association and 35 were by organizations whose shows were licensed by the association. This total, however, by no means represents the number of horse shows, which, counting small local shows and shows held in connection with county fairs, runs to much more than 1,000 annually. Most of the state fairs provide for somewhat elaborate horse show programs as do the annual American Royal Livestock show at Kansas City and the annual International Livestock show at Chicago. The National Horse show, which is the most famous of United States horse shows, held its 55th annual show Nov. 7 to 13, 1940, at Madison Square garden, New York city, with a program "dedicated to national defence and preparedness" and with the proceeds donated to the American Red Cross. Previously, horse-drawn artillery had been an interesting part of the National Horse show, but in 1940 this feature was replaced by "mechanized cavalry" consisting of tanks, armoured scout cars, field kitchens and motor-drawn artillery. Another wartime effect on the show was the absence of British and other military teams in the riding contests. The only army officers participating were those of the Chilean, Cuban, Mexican and United States military teams. The U.S. army team won the International Military Perpetual Challenge trophy. Major Eduardo Yanez of the Chilean army won the International Military Jumping stake, and Capt. Franklin F. Wing of the U.S. army won the International Individual Military championship. The Canadian "Mounties," heretofore one of the most colourful parts of the National Horse show programs, did not participate in the 1940 show. A new record was made in the contests for junior riders when James A. Thomas, Jr., of White Plains, N.Y., 16 years old, won both the Maclay trophy in jumping and the Welling Good Hands cup in a large field of junior riders. (S. O. R.)

Dogs.—Wars and rumours of wars did not in 1940 affect unfavourably "man's best friend" in the U.S. Dog shows numbered around 298 and breed registrations totalled 90,000, an increase over the previous year, with the merry little cocker still leading; other leading breeds in order—beagle, Boston, scottie, fox terrier, dachshund, Pekingese, springer, greyhound, collie. The largest dog show, also world's largest, one day outdoors, was the Morris and Essex show, Madison, N.J., with 3,462 dogs actually on the benches. Rip, golden retriever, and Solo Event, springer, were con-

sidered outstanding national winners in retriever and springer trials respectively. The smooth fox terrier champion Nornay Saddler, after winning 55 best-in-show triumphs at all-breed shows, a world's record, was retired. National dog week, Sept. 22–28, was observed in 237 cities and communities.

(W. Ju.)

Livestock.—Under world conditions of 1940, when the major British and continental livestock shows and fairs ceased to exist because of the war, the Chicago, Ill., show more than ever stood far in the lead as the world's largest event of its kind.

The 41st annual International Livestock exposition was held from Nov. 30 to Dec. 7, 1940. A total of 11,658 head of beef cattle, draught and light horses, sheep and swine were exhibited, with entries of both livestock and crops exhibited by stockmen and farmers from 36 states and five provinces of Canada.

First of the major U.S. shows in calendar position is the National Western Stock show at Denver, Colo., held in its 34th renewal Jan. 13 to 20, 1940. It was closely followed by the leading sectional agricultural show of the southwest, held in Ft. Worth, Tex. It is known as the Southwestern exposition and Fat Stock show. The 44th renewal was held March 8 to 17. It is the oldest stock show in the United States.

The eastern and western seaboards each have annual shows that include all breeds of livestock, but with major accents on the dairy breeds. These are the Eastern States exposition, founded in 1917 at Springfield, Mass., and held Sept. 15 to 21, 1940, and the Pacific International Livestock exposition, founded in 1911, and held in Portland, Ore., Oct. 5 to 12, 1940.

Two shows of national calibre feature the dairy breeds, one a midwest fixture, the National Dairy Cattle congress and National Belgian Horse show at Waterloo, Iowa, the other the National Dairy show, which since it was founded in Chicago in 1906 has, in later years, become an itinerant show.

The National Dairy show was held regularly in Chicago, using the same facilities as the International Livestock exposition, from 1906 to 1920. From then to date it has moved each year to different cities. The 1940 National Dairy show was held in Harrisburg, Pa., Oct. 12 to 19. The 31st Dairy Cattle congress took place in Waterloo, Iowa, Sept. 30 to Oct. 6. The National Belgian Horse show, held in connection, is the largest annual exhibition of this draught breed in the U.S.A.

Kansas City, Mo., is widely noted in agricultural circles as the home of the famous American Royal Live Stock show. The horse show is a particularly strong feature of this exposition, which celebrated its 41st renewal Nov. 9 to 16, 1940.

Huge livestock shows are held during the late summer months at the various midwest state fairs, which are preceded by county and district fairs that take place earlier in the season. On the basis of livestock exhibits, the major state fairs are held in Illinois, Indiana, Ohio, Iowa, Wisconsin and Minnesota. The Kentucky state fair at Louisville attracts the largest annual showing of saddle horses of any fair or show in the U.S.

Canada.—Canadian war activities disrupted, in part, the schedule of dominion agricultural shows. The two major Canadian expositions, both held in Toronto, Ont., are the Canadian National exposition, a summer show, and the Royal Winter fair, a November show. The latter show was not held after 1938, but the Canadian National, founded in 1879, was held from Aug. 23 to Sept. 7, 1940.

Europe.—Oldest of all the world's livestock shows are the Highland show of Scotland and the Royal Agricultural show of England. The Highland celebrated its 108th anniversary in 1939, and the Royal was 98 years old the same year. Neither was held in 1940.

South America.—South America's largest agricultural show, the Palermo, was held in Buenos Aires from Aug. 17 to 30, 1940. Unlike similar expositions elsewhere in the world, judging of livestock there is completed before the exposition is officially opened to the public.

(W. E. O.)

Siam (Thailand).

A kingdom of southern Asia between Burma and French Indo-China, extending southwards into the Malay Peninsula; area 198,247 sq.mi.; pop. (census 1937) 14,464,489, (est. 1938) 14,976,000. Chief towns: (pop. 1937) Bangkok (cap. 681,214); Chiengmai (544,001); Khonkaen (473,475); Chiengrai (443,476). Ruler: King Ananda Mahidol; language: Siamese; religion: Buddhism.

History.—During 1940 the king, aged 15 in September, continued his education in Switzerland, the country being governed by a council of regency under his cousin, Prince Aditya.

Thailand, known as Siam prior to May 1939, followed up her proclamation of neutrality made at the outbreak of the European war with treaties of non-aggression arrived at between herself and Great Britain, France and Japan and signed on June 12. The first named was ratified on Aug. 21 and in September an official mission left Bangkok on a round of visits to Burma, India, Malaya and Australia with a view to promoting friendly relations with the British empire. But ratification of the French treaty was postponed until certain modifications of the frontier between Thailand and French Indo-China, negotiations for which were at the time in progress, had been made, and in mid-September Thailand demanded of France the cession of border territory with certain islands in the Mekong river. This step seems to have been taken largely because of the uncertainty of the future of the French colony, especially in view of Japan's possible actions which, it was feared, might foreshadow an attempt to use Thailand as a highway to Singapore in the event of future hostilities. Early in October the Thai prime minister gave the assurance that his country would not resort to arms to make good its claims, and that an arbitration commission would be called to settle the frontier questions; but in November French males in Indo-China between the ages of 40 and 50 were called up, indicating that the dispute had become aggravated.

Education.—In 1936–37: elementary schools 8,983; scholars 1,151,915; secondary schools 206; scholars 42,225; special schools 2,984; scholars 33,087; universities, number of students enrolled 11,525.

Banking and Finance.—Revenue, ordinary (est. 1939–40) 124,060,700 baht; expenditure, ordinary (est. 1939–40) 124,058,100 baht; expenditure, capital (est. 1939–40) 22,889,360 baht; public debt (Mar. 31, 1938) 80,593,000 baht; notes in circulation (June 30, 1939) 151,000,000 baht; exchange reserve (June 30, 1939) 127,000,000 baht; gold reserve (June 30, 1939) 18,000,000 baht; exchange rate (approx.) 11 baht = £1 sterling.

Trade and Communication.—Foreign trade 1938–39 (merchandise): imports 123,575,000 baht; exports 173,078,000 baht. Communications: roads, state highways completed (1938) 1,815 mi.; railways, open to traffic (1938) 1,925 mi.; airways, length of route opened (1938) 444 mi.; motor vehicles licensed (1937–38): total 11,439 (cars 5,910; lorries 4,233; buses 146; cycles 559); wireless receiving set licences (1938) 29,834.

Agriculture and Mineral Production.—Production (in metric tons): rice (1938) 4,937,400; rubber (1938, exports) 42,000; tin ore, metal content (1938) 14,000; soybeans (1937) 9,721; tobacco (1937) 8,033; cotton (1937) 7,083; maize (1937) 5,025.

Sierra Leone: *see* British West Africa.

Silk and Silk Manufacture.

In the textile war of 1940, silk met with successive

defeats. The rising prices of 1939 dealt the final blow to the sole remaining field of silk fabrics. Underwear fabrics almost exclusively of pure silk up to that time, turned in 1940 to combinations of rayon and silk or all rayon with successful acceptance by the consumer markets. Nylon hosiery, offered for sale in the United States in May 1940, for the first time in commercial quantities, was sold by many merchants under an arrangement of two pairs of silk hosiery for every one of nylon in an effort to stem the tide of favour to the new fibre.

In Great Britain, as of Oct. 16, 1940, licences were required for the use of raw silk for any purpose other than government or export orders. The sale of silk hosiery and silk piece goods was prohibited after the end of November.

Both in the United States and Great Britain, concern centred in the potential supply of raw silk, due to strained diplomatic relations with Japan. The stock situation at the close of the year was said not to warrant immediate alarm. The total estimated stock of 72,248 bales as of Jan. 1, 1941, represented nearly three times the average monthly consumption of 1940 and the prospects were for lower rather than higher consumption during 1941. The total consumption for 1940 was over 20% less than for 1939. Demand for silk was the lowest since the war of 1914–18. Average 1940 prices on the New York market did not vary materially from the 1939 average but the general loss of interest in silk was indicated by the constantly dropping price through the year. Beginning at $3.09 a pound in the first third, the end of December showed $2.55 a pound.

Hosiery manufacturers took a smaller proportion of silk in 1940. In a comparison of raw silk deliveries in July through October, four months, going to hosiery there was a decrease of seven points in 1940 over 1939. The changing proportion was partially accounted for by increased consumption of silk by mills on defence orders for parachute silk and such smaller wares as silk sewing thread, silk neckerchiefs, silk cords and braids, etc. Several million yards of parachute silk were ordered and the necessary raw silk purchases by weavers meant a shifting in the proportionate rate of weaving to knitting consumption. A substantial amount of the silk imported, however, at the close of the year, was reported to be held by importers in the warehouses, in anticipation of any interruption in shipping due to world conditions.

Elsewhere in the world, silk's condition was no more promising. The French surrender resulted in virtually a complete stoppage of exportation. Lyons, the silk city, was unoccupied territory and manufacturers hoped that exports could continue at least in restricted quantities. The last available reports on actual shipments were for September when exports for the September quarter were valued at $11,099, as compared with a 1939 value of $187,062. A subsequent government decree of Sept. 13 imposed export restrictions that eliminated all silk shipments. In Italy, production of silk cocoons during 1940 was about 34,000,000 kg. as against 28,400,000 in 1939, but trade was slow. During the first six months of 1940, exports to the United States amounted to 404,809 lb. valued at $953,617. Chinese raw silk exports showed an increase. Approximately 3,500 bales were exported to the United States, by Japanese firms, during the first eight months of 1940, and most of this was in the better grades. Considerable quantities of waste silk were also shipped to the United States. The latter is essential in manufacturing cartridge bag cloth, a munitions requirement.

The importance of silk as an economic power in Japan was emphasized by the visit of a mission to the United States in the summer of 1940, under the leadership of the Honourable Gosuke Imai, life member of the house of peers in Japan and head of the great house of Katakura Silk Spinning company in Tokyo. Conferences were held with representative silk consuming groups but the general impression was conveyed by the U.S. firms that the drift away from the use of silk was too advanced to stem. Later a printed interview with Senator Imai on his return to Japan quoted him as saying, on nylon, "in regard to its popular appeal as a substitute for silk it was not being received over-enthusiastically by the general public." In the face of retail sales records in nylon hosiery, commentators on this interview believed it indicated once more that the chief suppliers of silk were in a state of "wishful thinking." (*See* also RAYON.)

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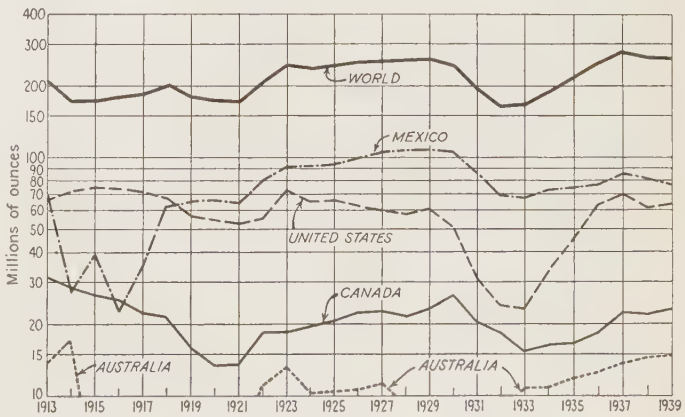
Silver. The world's silver production is rather heavily centred in North America; this continent in 1929 furnished 75% of the total output, and 61% in 1940; Mexico is the leading producer, with 29%, followed by the United States with 22%, Canada with 9% and the remainder of the continent (including Central America, West Indies and Newfoundland) 2%. The status of the important producers is shown in the accompanying graph and table.

World Production of Silver
(In millions of fine ounces)

	1929	1933	1937	1938	1939
Canada	23.1	15.2	23.0	22.2	23.1
United States	60.3	21.0	69.3	58.7	57.8
Mexico	108.7	68.1	84.7	81.0	75.9
Other N. America	2.8	6.0	5.1	5.9	5.9
Peru	21.5	7.3	17.2	20.5	18.2
Bolivia	6.2	5.5	9.5	6.4	7.2
Other S. America	1.7	0.6	6.1	5.5	5.5
Germany	5.5	6.3	6.8	7.0	7.0
U.S.S.R.	0.4	1.0	5.0	7.0	7.0
Other Europe	5.5	8.0	8.2	8.2	8.1
Japan	5.2	6.0	10.0	10.0	11.0
India	7.3	7.3	6.9	6.5	6.8
Other Asia	2.3	1.9	3.8	4.3	4.5
Africa	1.3	4.0	5.3	5.7	5.4
Oceania	9.9	11.6	14.8	15.1	15.4
Total	261.5	169.7	275.1	264.1	258.9

World figures for the first nine months of 1940, although not quite complete, indicated a rate practically identical with 1939. Mexican returns through August were 10% ahead of the 1939 rate and about on a par with 1937. Mine production in the United States was 71,109,000 oz., an increase of 8%. Canadian output through September was practically identical with the 1939 rate.

The New York quotation on newly-mined domestic silver stood at 70.625 cents throughout 1940. The New York market for foreign silver opened at 34.75 cents, which held to May 20, ad-



SILVER PRODUCTION: world total and output of the major producing countries, as compiled by *The Mineral Industry*

vanced to 35.625 cents at the end of the month and then receded to the former level on June 4, remaining unchanged to the end of the year. The London market opened at 22*d.* and showed only minor changes until midyear; during the second half prices were slightly higher, with a high of 23.5*d.*, and the year ended at 22.5*d.*, with an average of 22.28*d.*, an advance of 8% over 1939; while the New York average, at 34.773 cents, was 11% below 1939.

British production of silver is comparatively small; the United Kingdom itself has only a negligible output, and empire production centres chiefly in Canada, Australia, Burma and South Africa. Empire production as a whole in 1939 was 18% of the world total against 16% in 1929. (*See* also MINERAL AND METAL PRICES AND PRODUCTION.) (G. A. RO.)

Simmons, Furnifold McLendell (1854–1940), U.S. attorney and legislator, was born in Jones county, N.C., Jan. 20. He was graduated from Trinity college, now Duke university, in 1873, and two years later was admitted to the bar and opened an office in New Bern, N.C. He served in the 50th congress from the second North Carolina district and at the expiration of his term resumed his law practice. He was a collector of internal revenue for four years from 1893. As chairman of the Democratic state committee of North Carolina he succeeded in reorganizing the party which had been demoralized by the Populist movement and winning the election in 1898. He was elected to the United States senate in 1901 and served five terms. While in the senate he was chairman of the finance committee for six years and was the co-author with Representative Underwood of the Underwood-Simmons Tariff act. He died in New Bern, April 30.

Singapore, the capital of the Straits Settlements (*q.v.*) and main port of southeastern Asia, located at the intersection of the trade routes to Australia and to India and Europe, is on an island, of the same name, 27 mi. long and 14 mi. broad, at the tip of the Malay peninsula. It is situated at 1° 20′ N. The population of Singapore island (June 30, 1939) was 727,564. The great British naval base at Singapore is on the northern side of the island, on the Strait of Johore. It possesses vast dry and floating dock facilities; but up to the end of 1940 few ships had taken advantage of it, as the bulk of the British navy was stationed in European waters. There was a land garrison of about 7,000 men in 1940 and the royal air force maintained two bomber and two reconnaissance squadrons there. Singapore is generally considered the strategic key to the British position in southeastern Asia, protecting the neighbouring Netherlands Indies and also covering the approaches to Australia and India.

(W. H. CH.)

Singer, Harold Douglas (1875–1940), U.S. alienist, was born in London, Jan. 7, and studied medicine at the University of London, St. Thomas's hospital and the Royal College of Physicians. He served in hospitals in London from 1898 to 1904, when he went to the United States to become associate professor of neurology at Creighton university, Omaha, Neb. He became director of the Illinois State Psychopathic institute in 1907, holding that post until 1920. He was state alienist for Illinois from 1917 to 1920 and medical consultant to the director of the United States Veterans' bureau from 1919 to 1922. He was appointed professor of psychiatry in the medical college of the University of Illinois in 1919, a post which he held until his death. Dr. Singer was a fellow of the Royal Society of Medicine and the Royal College of Physicians, and on June 7, 1940, was elected president of the American Neurological association. He died in Albuquerque, N.M., Aug. 29.

Sin Kiang (CHINESE TURKESTAN), area 705,769 sq.mi., population 4,360,020 (estimate of the Chinese ministry of the interior, 1936), is one of the largest, most remote, isolated and sparsely populated regions of China. The name means New Dominion and it is not an integral part of China, being separated from China proper by vast stretches of desert and some difficult mountains. The principal towns are Kashgar (80,000) and Yarkand (75,000) in the southwest and Urumtsi (50,000) in the north. The latter is the seat of the Chinese administration. The chairman of the provincial government is Li Yung. Much of Sin Kiang is waste and desert country; but along the Kashgar and Yarkand rivers there is irrigation. The main products are cereals, fruits, vegetables, wool, cotton and silk. Economically Chinese Turkestan has always gravitated toward Russia; and this tendency has been strengthened by the construction of the Turkestan-Siberia railway in the soviet union (opened 1930) which passes close to the frontier of the province. There is some caravan trade with British India and an old caravan route from Urumtsi has been utilized for the dispatch of soviet munitions and supplies to China. Soviet influence is strong in Sin Kiang, especially in the northern part, and foreigners are seldom allowed to enter the country, with the result that news is scanty and irregular. Since 1930 there has been sporadic fighting between troops supporting the Chinese administration and Turki insurgents in the southern part of the country. (W. H. CH.)

Sino-Japanese War: *see* CHINESE-JAPANESE WAR; FOREIGN MISSIONS.
Skating: *see* ICE SKATING.
Skin Diseases: *see* DERMATOLOGY.
Sleeping Sickness: *see* HORSES.

Slovakia. Slovakia, a republic in central Europe under German protectorate, bounded on the N., W. and S. by Germany, on the E. and S. by Hungary, has an area of 14,848 sq.mi., with a population of about 2,800,000, of whom the great majority are Slovaks, a Slav people closely akin racially and linguistically to their immediate western neighbours, the Czechs. The large majority of them are Roman Catholic, but there is a considerable Protestant minority. The most important racial minorities are about 100,000 Germans and 70,000 Magyars. The population is largely agricultural. There are few towns of importance; the capital is Bratislava (Pressburg) on the Danube, with a population of 125,000.

Slovakia, which formed a part of Hungary before 1918, was from 1918 to 1939 part of the Czechoslovak republic. Having been constituted as an autonomous province with its own government in Oct. 1938, Slovakia under its prime minister Joseph Tiso, a Catholic priest, leaned more and more towards national socialism and in March 1939, with the help of Germany, declared itself an independent republic. It signed a treaty with Germany according to which German armed forces received the right to occupy Slovakia at any time and to erect there military plants deemed necessary to Germany. In exchange, Germany promised to protect the independence and territorial integrity of Slovakia for 25 years. Slovakia pledged herself to conduct her foreign policy and to organize her army in agreement with Germany. During Germany's war against Poland in Sept. 1939, German troops not only acted against Poland from Slovakian territory, but Slovakia participated in that war, in spite of an often-stressed friendship between Catholic Slovakia and Catholic Poland. In Oct. 1939, Mgr. Tiso was elected president of the republic and Dr. Bela Tuka became its prime minister.

During 1940 the regime in Slovakia was co-ordinated even more closely with that of Germany. The replacement of Dr. Durčansky

as minister of foreign affairs and minister of the interior by Dr. Tuka and Sano Mach, respectively, intensified the national socialist trend. The Slovakian parliament was replaced by a state council with advisory functions; economic life was organized after the model of the corporate state. Jews were not only excluded from all participation in the political and cultural life, but also deprived of all their positions in the economic life of Slovakia and subjected to a fast-growing number of restrictions and disqualifications. On the other hand, the German minority in Slovakia enjoyed especially favourable treatment and organized itself along national socialist lines. As in her internal policy, so in her foreign policy Slovakia followed closely the national socialist party line. She established friendly relations with the soviet union and the prime minister's brother was sent as minister to Moscow. On Nov. 24 Slovakia adhered officially to the Rome-Berlin-Tokyo pact, which, in view of her position as a German protectorate, had been a foregone conclusion. Only with Hungary did her relations remain strained throughout. Frequent bitter complaints were heard about the treatment of the respective minorities in the two states and it was believed that Hungary still cherished the hope of including Slovakia again within her borders. On the other hand, many Slovak personalities joined abroad with Czech statesmen and politicians to form a new Czechoslovak government under the former president of Czechoslovakia, Dr. Eduard Beneš, and to work for the restitution of a "free Czechoslovakia within a free Europe." (H. Ko.)

Smith College. On Oct. 17, 1940, Herbert John Davis, formerly professor of English at Cornell university, was inaugurated as the fourth president of Smith college, following a year in which Mrs. Dwight Morrow acted as president after the resignation of William Allan Neilson. Because of world conditions there was no junior year abroad; the junior year in Mexico, which had been arranged to replace the junior year in Spain, was cancelled in August because of political conditions in Mexico. Enrolment at the college for the academic year 1940–41 was 2,083 students; the faculty numbered 246; and the number of volumes in the library was increased to 279,363. The endowment in 1940 was $6,168,823. (M. H. N.)

Smithsonian Institution. The institution was founded in 1846 by bequest of James Smithson of England, "for the increase and diffusion of knowledge among men." The governing body is a board of regents. Executive officer, Dr. Charles Greeley Abbot, secretary. The institution directs six government bureaus; also the Freer Gallery of Art and the Division of Radiation and Organisms.

Activities in 1940.—*Smithsonian:* Completed fourth year of weekly educational radio broadcasts, "The World Is Yours," in co-operation with U.S. Office of Education and National Broadcasting company; published a volume of essays in historical anthropology of North America, prepared by members of the institution's anthropological staff, and dedicated to Dr. John R. Swanton in honour of his 40th year on the scientific staff of the institution; publications issued (Smithsonian and all its branches), 78; distributed, 146,156 copies. *National Museum:* Specimens added to collection, 212,474; numerous scientific expeditions in the field; 12 special exhibitions held; visitors, 2,506,171; publications issued, 30; distributed, 65,962 copies. *National Gallery of Art:* Gallery established by joint resolution of congress. Art works and building to contain them was a gift to the nation by the late Andrew W. Mellon. The gallery is designated as a bureau of the institution, but is administered by a board of nine trustees; David K. E. Bruce, president; David E. Finley, director. At the close of the fiscal year 1940, construction of the building was nearly completed. It will be opened to the public early in 1941; estimated cost, $15,000,000. The building will also house the Samuel H. Kress collection of Italian paintings and sculpture, a gift of Samuel H. Kress and the Samuel H. Kress foundation to the gallery. *National Collection of Fine Arts:* This name designates art collections administered by the Smithsonian institution. Seven special exhibitions were held; the 19th annual meeting of the Smithsonian Art commission (formerly National Gallery of Art commission) was held Dec. 5, 1939. *Freer Gallery of Art:* Added to its collections Chinese bamboo, bronze, jade, marble, painting and pottery; East Indian and Arabic manuscripts; Iranian (Persian) and Syro-Egyptian metal work; and Indian and Persian painting. Visitors, 108,770. *Bureau of American Ethnology:* M. W. Stirling, chief, directed an expedition, in co-operation with the National Geographic society, to Mexico, where 20 stone monuments, including one with initial-series date, were discovered at Cerro de Mesa and 20 at La Venta. Other field work on American Indians was conducted by the following members of the scientific staff: Dr. J. R. Swanton, Dr. F. H. H. Roberts, Jr., Dr. J. H. Steward, Dr. William N. Fenton; linguistic studies were conducted by Dr. J. P. Harrington; Henry B. Collins, Jr., continued work on prehistoric Eskimo material excavated in 1936 around Bering strait; Miss Frances Densmore, collaborator of the bureau, continued her study of Indian music; publications issued, 3; distributed, 13,984 copies. *International Exchange Service:* Official agency for the United States for interchange with other countries of governmental and scientific documents; packages of such material handled during year were 639,344; weight, 527,545 pounds. *National Zoological Park:* Dr. William M. Mann, director, conducted the Smithsonian-Firestone expedition to Liberia, and brought back 200 animals for the collections; new restaurant building begun under an allotment from PWA; total number of animals in collection, 2,550; visitors, 2,129,600. *Astrophysical Observatory:* The observatory maintained solar stations at Mt. Montezuma, Chile, Table mountain, Calif., and Tyrone, N. Mex., and continued work on a complete revision of all solar-constant values since 1923. *Division of Radiation and Organisms:* Carried on investigations in the field of radiation in relation to plant growth, especially photosynthesis, respiration and chlorophyll formation, factors influencing plant growth, and stimulative action of ultraviolet radiation. The division published 3 papers. (C. G. A.)

Soap, Perfumery and Cosmetics. Following Italy's entrance into the European war in June 1940 and the fall of France, supplies of certain raw materials used by these three industries were severely restricted in the United States. Italian talc, always esteemed for its fine quality by makers of talcum powders, face powders and "dry" rouges, almost disappeared from U.S. markets; while, with prices soaring, such products as Italian oil of bergamot and Algerian oil of geranium remained only in nominal supply. However, the situation with respect to aromatic materials was by no means as acute as it was in the war of 1914–18, nor is it likely to become so in view of the great progress made since then in the production of synthetic aromatics in the United States.

In 1940, political and military events abroad further emphasized a trend in U.S. consumer markets that was already noticeable in 1939, when many cosmetic producers, dubious of their ability to sustain sales volume without the help of those extravagant claims of efficacy from which they were restrained by legislation, turned to perfumery as a new source of revenue. In the words of one observer, it was remarkable how many cosmetics manufacturers had "quit making cosmetics and gone into the perfume business." The expanding industrial situation in 1940 fur-

ther stimulated the sale of perfume which, as an unequivocal luxury, is highly sensitive to the ups and downs of the economic cycle. But far and away the greatest impetus was given the expanding domestic perfume market by the fall of France, from time immemorial considered the greatest perfume producing country. Inevitably, thenafter, the American public asked itself whether so-called French perfumes were really coming from France; and, if so, were they any longer actually French?

In Great Britain the production of perfumes and cosmetics—as luxury goods—was moderately restricted by the government in 1940. And there also the government consistently stood out against any attempts to increase prices to meet the inevitable cost rises attendant on war conditions. As to the condition of these three industries in continental Europe there was little reliable information. By the same token it was not possible to gauge accurately the effect curtailed imports into the U.S. had in 1940 on the volume of domestic production. Dollar volume, susceptible to the pressure of countless variables, is never a reliable index of real volume. In these three industries, where so large a part of price may, and often does, represent intangible aesthetic satisfaction, it offers but a faint clue to actual production and consumption. (H. T.)

Value of Production of Soap, Perfumery and Cosmetics, 1939 and 1937
(Source: U. S. Bureau of Census)

	1939	1937
Soap and Glycerine	$302,634,474	$301,291,547
Perfumes, Cosmetics and Toilet Preparations	147,465,585	132,336,481

Note the difference in increase of soap and glycerine which is a pretty staple industry as compared with that in a luxury industry (perfumes and cosmetics) from 1937, a bad year, to 1939.

Soccer. The game enjoyed an international flavour during the 1940 season when a team from the Club Atlanta, Mexico City, showed its supremacy during a series of six exhibition matches in New York city, Chicago, Ill., St. Louis, Mo., and Fall River, Mass., winning four of their games and tying two.

Of the three games played on Randall's Island, New York, the Atlantas defeated the N. Y. Americans 1–0, beat the Brooklyn Hispanos 6–2, and reached a 2–2 tie with a picked team of the American Soccer league. On the road the Atlantas tied the New England All-Stars 1–1 at Fall River; they defeated the All-Stars of St. Louis 6–1, and the Sports club, Chicago, 4–1.

The annual contest between the east and the west for the U.S. football association cup competition ended in a tie between the Baltimore club and Chicago's Sparta club. The national amateur cup was awarded to the Morgan Football club of Morgan, Pa., after defeating the Firestone F. C. of Fall River. The national junior cup was won by the Avelia F. C. of Pittsburgh from the Yorkville Celtics.

In professional soccer, the Scots-Americans, of Kearny, N. J., successfully defended the championship of the American league, defeating the Brooklyn team in the final of the Lewis cup competition. The German-Hungarians defeated the Swedish team in the New York state cup finals, after the Swedish eleven won the National league title. The Metropolitan league cup was awarded to the Bronx Scots, and the N. Y. state junior cup went to the Yorkville A. C. Juniors. (J. B. P.)

Socialism. In the United States, the Socialist party, at a national convention in Washington, D.C., on April 7, 1940, nominated Norman Thomas for the fourth time as its candidate for president of the United States and Maynard C. Krueger of the department of economics, University of Chicago, as its vice-presidential candidate. These candidates ran on a platform which maintained that democratic socialism constituted "the one road to plenty, peace and freedom." The party's national executive committee, at its July 21 meeting, issued a statement declaring its opposition to totalitarianism in every form and opposition likewise to U.S. participation in war. It declared, at the same time, that it did not "seek the repeal of the neutrality law under which England derives great benefit" and that it shared "the hope that the British people may defeat the nazi invader."

In the ensuing presidential election on Nov. 5, 116,796 votes were recorded as having been cast for the Socialist candidates, as compared with 188,014 in 1936 and 884,781 in 1932. The Communist party received 48,789 votes; the Socialist Labor party, 14,861. Daniel W. Hoan, Socialist mayor of Milwaukee since 1916, was defeated in April for re-election as mayor. The Social Democratic federation during the year urged maximum aid to Great Britain. Many figures prominent in international socialism, including Frederick Adler, secretary of the Labor and Socialist International, secured passage to the United States in the fall of 1940.

Great Britain.—In Great Britain, the British Labour party continued its vigorous support of the war. In May 1940, on the resignation of Prime Minister Chamberlain and the reconstruction of the British cabinet under Winston Churchill, C. R. Atlee, parliamentary leader of the Labour party, and Arthur Greenwood became members of the inner war cabinet. Herbert Morrison, head of the London Labour party and the government of London, was appointed minister of supply. Other Labour members appointed were: Ernest Bevin, minister of labour and national service; Hugh Dalton, minister of economic warfare; A. V. Alexander, first lord of the admiralty; D. R. Grenfell, secretary of mines; and Sir William Jowett, solicitor general.

In the reorganized cabinet in October, Ernest Bevin was taken into the inner war cabinet, while Herbert Morrison was made minister of home security. (*See* also LABOUR PARTY.)

Sweden.—In Sweden, the Social Democratic government remained in office during the year under the premiership of Per Albin Hansson, the cabinet containing 6 Social Democrats, 2 Conservatives, 2 members of the Agrarian party and 1 nonpartisan specialist. At the regular election held in Sept. 1940, for the lower chamber, the Social Democrats elected 134 out of 230 representatives (a clear majority) as compared with 115 in 1936. The Conservatives won 42, a loss of 2; the Agrarians, 28, a loss of 8; the People's party (liberals) 23, a loss of 4; the Communists, 5, a loss of 2. The Swedish nazi party won no seats. The country during the year greatly increased its budget for defence. It was forced to make a number of concessions to Germany, but Premier Hansson maintained that these concessions were not "a surrender of our neutrality or independence and represented no change in our foreign policy."

Switzerland.—In Switzerland, the Social Democratic party during the year remained the second largest party, with 49 seats in the lower house out of 187.

Finland.—Socialists remained members of the Finnish cabinet during 1940, V. Tanner, former Social Democratic premier, acting as minister of food supply. A split situation developed in the Social Democratic party.

Denmark.—In Denmark, the Stauning government remained in office, though under strict nazi supervision. Records of all trade unions were confiscated by the nazis, who suppressed many civil rights.

Norway.—In Norway, Prime Minister Nygaardsvold, leader of the Labour government of Norway, and many of the Labour cabinet escaped to Great Britain after the nazi invasion and conducted the "official" government from London, from which the large Norwegian fleet of merchant vessels was directed. The

government in London maintained that "the battle for freedom and independence will not be given up." Within Norway, the commissioner appointed by the reich proclaimed the "abolition" of the Nygaardsvold government and of all political parties except Quisling's nazi-dominated organization. Much sabotage against nazi officers was reported.

France.—Following the French defeat, the French Socialist party disappeared as an organized force. Leon Blum, leader of the French Socialist party and former premier, was arrested on Nov. 19, 1940 and placed in a detention centre near Riom. Many other Socialists were interned. The C.G.T. was taken under nazi control.

Belgium and Holland.—The Socialist movements in Belgium and Holland were likewise liquidated by the Germans. All possessions of the Dutch Labour party were seized and the council of the Labour party dismissed.

Australia.—The Labour opposition in Australia, including the New South Wales Non-Communist Labour group, elected 36 members to the house of representatives in the 1940 elections, a gain of 4. The Ministerialists retained 38 seats. The Labour party refused to join a coalition ministry, but sent representatives, including John Curtin, F. M. Ford and N. J. Makin, to the advisory war council which co-operated with the government in the carrying on of the war.

New Zealand.—In New Zealand, the Labour party government, under Prime Minister Peter Fraser, took an active part in the prosecution of the war and advanced measures for wealth conscription, free national medical care and compulsory acquisition of land by the state. The left wing of the movement urged a program of thoroughgoing socialization.

South America.—In South America, Socialists were active in many countries, especially in Argentina and Chile. In Chile, they were represented by 4 members of a Popular Front cabinet which contained 6 Radicals and one Democrat. (*See* also COMMUNISM.)

(H. W. L.)

Socialist Party. A careful inquiry early in 1940 confirmed the general Socialist feeling that there would be no nationwide labour or progressive "third" party in the 1940 campaign. Hence the convention of the Socialist party held in Washington, D. C., April 5–7, nominated a national ticket and planned a vigorous campaign. The candidates named unanimously were Norman Thomas of New York for president and Maynard Krueger of Illinois for vice-president. The former had been the party's candidate in 1928, 1932 and 1936, the latter an assistant professor of economics at Chicago university.

The platform urged immediate democratic socialization as the alternative to a drift to fascism, and as the best way to increase the national income and divide it more equitably. This process requires, it held, social control of money, banking and credit, social ownership of the great national resources and the socialization of those monopoly and semi-monopoly activities which were not producing enough to meet social needs. The platform opposed U.S. participation in the war as fatal to U.S. democracy.

Events following the convention forced the war issue to the foreground. The party opposed peacetime military conscription as unnecessary to the national safety and a danger to democracy. It challenged the magnitude and lack of co-ordination of the armament program and saw it as in part the result of the failure of private capitalism to meet United States needs.

Under the most difficult conditions in U.S. history, the party got on the ballot in 29 states, containing about 75% of the population. It polled 116,796 votes. After the campaign it determined upon a wider, more intensive educational program through the preparation of a book developing its economic position, through the enlargement of its weekly paper, the *Call*, and a better use of radio.

(N. T.)

Socialist Soviet Republics: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Socialized Medicine: *see* MEDICINE.

Social Security. The outstanding 1940 event in social security in the United States was the inauguration, on Jan. 1, of the benefits under the federal old age and survivors insurance program of the Social Security act. This was the result of the drastic changes made in the act in 1939 which, in addition to commencing the benefit payments two years earlier, changed its basic principles by providing greater protection to the oldest and lowest-paid workers and extending benefits to the families and survivors of the insured.

As the law stands, "primary" benefits to retired workers at 65 are computed at 40% of the first $50 of the average monthly wage earned after 1936 or after reaching age 21, plus 10% of the balance, up to $250 monthly. One per cent of the total is added for each year after 1936 with at least $200 in wages. Thus, a worker who averaged $100 a month in the preceding three years was entitled upon retirement in Jan. 1940 to $25.75, which will be paid to him each month for the rest of his life.

Benefits for Wives and Children.—The wife of an insured worker, upon reaching age 65, is allowed 50% of her husband's primary benefit, or in the example cited above, a total of $38.63 monthly for the couple. She may receive a larger primary benefit if entitled to one in her own right. Each unmarried dependent child of a retired worker may receive 50% of the wage-earner's primary benefits until he reaches the age of 16, or 18 if regularly attending school.

Benefits for Widows, Orphans and Parents.—The new program also protects survivors of insured workers who died after Dec. 31, 1939. A widow aged 65 or over is entitled to 75% of her husband's monthly primary benefits for the rest of her life unless she remarries. For every dependent child another 50% is paid. Widows of any age with dependent minor children are entitled to three-fourths of the primary annuity for themselves and 50% for each eligible child. If a worker leaves no other survivors, his parents 65 years of age and over, wholly dependent upon him, are each entitled to 50% of the primary benefits. A lump sum not exceeding six times the primary annuity is paid when no eligible dependent survives.

Maximum benefits permissible under the act are either double the primary insurance benefits, 80% of average wages, or $85, whichever is the least, while the minimum is $10 monthly. Earnings of $15 or more per month automatically stop the benefits during the month they are earned. All the above benefits are paid to or on behalf of insured workers who earned at least $50 in one-half of the calendar quarters elapsing between the end of 1936 and the time of death or retirement, or at least in six such quarters. Orphans and widows are entitled to benefits if the worker had earned $50 in six of the 12 quarters immediately preceding his death. The 1939 changes also halted the scheduled increase in the taxes for the three years 1940–42, keeping them at 1% each for employers and workers for this period.

By Oct. 31, 1940, 320 000 claims for old age and survivors benefits were received in Washington. The beneficiaries receiving monthly benefits by that time reached 185,000, while approximately 25,000 were being added monthly. Of the new beneficiaries, approximately one-half were aged workers, one-seventh aged wives and one-third orphans and younger widows of deceased workers. Benefits averaged about $22 monthly for a single

aged male worker, $36 for aged couples, $35 for a widow with one child and $48 for a widow with two children. Total benefits paid since the inception of the program amounted to $41,809,000 by Sept. 1, 1940, when the reserves of the system reached $1,-893,000,000.

Railroad Retirement Act.—Under the second national system of old age protection, the Railroad Retirement act, 147,123 pensions and annuities of various types were in force on Sept. 30, 1940. The average benefit on that date amounted to $65.55 for employee annuitants, $58.73 for pensioners, $32.88 for survivor annuitants and $35.97 for death benefit annuitants. Expenditures for Sept. 1940 amounted to $10,069,473. From 1937, when the act first became operative, to Oct. 1, 1940, $338,154,000 were expended in benefits and $412,869,000 collected in contributions.

Public Assistance.—Through the federal-state assistance programs for the aged, there was spent a total of $314,603,570 during the first eight months of 1940. This compared with a total of $284,607,293 spent in the same period in 1939. In Aug. 1940, the 51 jurisdictions operating under approved plans aided 2,007,-537 aged, representing 25.3% of the population over 65, at a cost of $40,399,949. The average grant was $20.12 per person per month as against an average of $19.43 in Aug. 1939. The great disparity in the state averages continued, California having paid an average of $37.93 in Aug. 1940, while Arkansas paid but $7.22. Seven states paid average grants of less than $10 during that month. Because of this situation, discussion regarding changes in this phase of the Social Security act centred during 1940 on larger proportional national subsidies to the poorer states.

The 42 jurisdictions with approved plans for aid to dependent children assisted 820,484 children in 339,508 families during Aug. 1940 at a cost of $10,929,667, or an average of $32.19 per family. The number of aided children increased 13.9% over Aug. 1939, and the monthly cost 16.8%. The average state grants ranged from $11.45 in Arkansas to $57.55 in Massachusetts. Alaska, Connecticut, Illinois, Iowa, Kentucky, Mississippi, Nevada, South Dakota and Texas did not operate approved programs that month. The approved plans for the needy blind in 43 jurisdictions spent $1,132,627 in Aug. 1940 on 48,136 persons, or an average of $23.53. The monthly cost represented a rise of 8.2% over Aug. 1939, while the number of recipients rose 6.3%. Here, too, the disparity in average payments was considerable—from $8.02 in Mississippi to $48.05 in California. Lacking approved programs for the blind in Aug. 1940, were Alaska, Delaware, Illinois, Kentucky, Missouri, Nevada, Pennsylvania and Texas.

A decline in the popularity of the panacea programs for the aged was clearly evident during 1940. Pension utopias played but a small role in the 1940 elections.

Unemployment Insurance.—In the first ten months of 1940, the 51 jurisdictions paying unemployment insurance benefits expended $459,499,000, marking a rise of 16.6% in comparable payments for the same period of 1939. In Aug. the 51 jurisdictions expended $51,696,768 on an average of 1,121,754 beneficiaries. Up to Nov. 1, 1940, a total of $1,283,878,000 was spent in benefit payments. On Sept. 1, 1940, the states had a reserve of $1,799,000,000. Of the benefits for total unemployment paid during the second quarter of 1940, 44.9% was for less than $10, 29.8% between $10 and $14.99 and 25.3% for $15 and over. A study of the operation of the unemployment insurance systems in 1939 revealed that an average of $84.24 was paid out during the year in 34 jurisdictions. The average duration of payments in 11 states ranged from 8.3 to 13.6 weeks. The 1939 benefits represented 54 cents of every dollar collected during that year.

The federal system of unemployment insurance for railroad workers spent $1,026,485 during Sept. 1940. From its inauguration in July 1939 through Sept. 1940 this plan expended $17,-530,400 in benefits, leaving a balance of $87,317,000 in its account.

Health Insurance.—After months of deliberation by experts and students, the model health insurance bill of the American Association for Social Security was completely revised and presented before the New York legislature. U.S. Senator Arthur Capper of Kansas introduced the federal-state measure based on the revised bill in Congress. Other medical aid bills were introduced in congress as well as in several state legislatures. (*See* also CHILD WELFARE; LAW [CASE]: *Social Security;* LEGISLATION: *State;* UNITED STATES: *Social Security.*) (A. EP.)

Great Britain.—Changes were made in the system of national insurance during the year 1940 by the Old Age and Widows' Pensions act, 1940, which became fully effective in August. Under its provisions supplementary pensions to old age and widow pensioners according to need became payable for the first time; and the age at which contributory pensions are payable to women was reduced from 65 to 60.

In arriving at the amount of a supplementary pension the assistance board assesses the need of the pensioner as if the household had no resources, and then deducts the resources of the whole household (including the pension), though resources in the nature of sick pay, disability pensions, national health insurance benefit, etc., are not taken fully into account. The basic rate for a married couple not being members of a larger household is 31*s.* if only one of them is a pensioner and 32*s.* if both are, and for a person living alone 19*s.*6*d.*; in each case the main pension is made up to the named sum, subject to adjustment on account of rent or special circumstances, and to further increase during the 22 weeks of winter. These supplements make it unnecessary for needy pensioners to apply to public assistance committees and relieve local authorities to the extent of some £5,250,000 a year.

To help meet the cost of these additional benefits the act increased the ordinary rates of contribution by 2*d.* a week for men and 3*d.* for women, of which employers pay 1*d.* in each case. This was expected to meet the cost (about £8,000,000 a year) of lowering the pension age for wives and insured women.

Unemployment Insurance.—The 1939 report gave the income of the unemployment fund, general account, as £67,283,926 (an increase for the year of over £1,388,000) and expenditure as £50,682,348 (a decrease of over £11,637,000), bringing the balance to £57,555,000. In view of the likelihood of there being serious unemployment following the close of hostilities, £37,-000,000 of this were allocated to the repayment of debt, thereby reducing the annual debt charge by about £1,100,000, which enabled an increase in benefit of 1*s.* per week to be made for each of the first two children of unemployed persons. The agricultural accounts income exceeded expenditure by over £623,000, the balance rising to £3,397,222; benefit for dependent children was thereupon increased as under the general scheme, and the maximum limit of total benefit raised from 33*s.* to 35*s.* per week which, by the act passed in July 1940, was further increased to 41*s.*

In February the minister of labour and national service announced an expansion of the ministry's training organization; 14 centres, training 8,000 men, were then active; during 1940 others were added and over 1,000 additional instructors engaged; and it was hoped that an annual output of over 100,000 trained men would be obtained from unemployed over military age or unacceptable to or reserved from military service.

In July a new Unemployment Insurance act received the royal assent; weekly rates of benefit were raised by 2*s.* for young men and young women (aged 18–20) and all women in the agricultural

scheme, and by 3*s.* for all others (aged 21–64); further, benefit became payable on unemployment for two days, instead of three as hitherto, out of any consecutive six days. The additional cost was met by an increase in the weekly contribution of 1*d.* (½*d.* in the agricultural scheme) from each party, viz., employer, worker and exchequer. The act also extended the insurance scheme to most non-manual (black-coated, or white-collar) workers whose remuneration did not exceed £420 a year (previously £250), and included certain wartime safeguards, withholding benefit from persons disregarding defence regulations relating to employment. At the end of the year a government bill was introduced substantially modifying the household means test for unemployment assistance and supplementary pensions.

The latest available statistics showed that in Sept. 1940 the total number of persons registered as wholly unemployed was 613,671 as compared with 1,052,218 in Sept. 1939. (L. H. D.)

Societies and Associations: *see* under specific name.

Softball.

There were in 1940 an estimated 2,500,000 players among young men and women, representing some 110,000 teams. Played on a diamond about one third smaller than a baseball infield, the game is faster, while the ball is larger and not as hard as a baseball, and the bat is smaller. The Amateur Softball Association of America is the governing body of the amateurs.

The 1940 championship tournament of the association was similar to a small world's series in baseball. The annual title was won by the Rochester, N.Y., team, winning from the South Bend, Ind., aggregation. Harold Gears hurled for the victors and allowed only three hits.

Teams of women players also became more numerous. They played the game with as much speed and skill as the men. The association's title for women's teams was won by the Phoenix (Ariz.) Ramblers, defeating the Koch Furniture team of Cleveland, Ohio. (J. B. P.)

Soil Erosion and Soil Conservation.

Some of the warring nations in 1940 recognized soil conservation as necessary to the national welfare. Forced to protect all possible sources of home food supply, the German reich in the early spring decreed that all topsoil removed in the construction of highways, airports, fortifications and new industrial plants be transported to agricultural districts deficient in topsoil. In many of the British possessions, notably Australia, Canada, New Zealand and South Africa, conservation operations went on despite war demands. Throughout the world, erosion was recognized as a menace to national welfare, and unified conservation programs were being developed on every continent.

In North America, where erosion by wind and water has reached immense proportions, conservation operations were carried out on the largest scale the world has ever known.

An extensive mechanism for conservation of farm and range lands in the United States is the soil conservation district. Thirty-eight states have enacted laws enabling farmers to establish by popular election soil conservation districts, which as distinct units of local government are clothed with the power and authority to plan and carry out erosion control operations. The district is a democratic organization. The district officials, a majority of whom are elected by farmers from among their own numbers, administer the affairs of the district: they determine work priorities, approve farm plans, engage the assistance of local, state and federal agencies and perform the other duties related to the job.

By Dec. 1940, there were 428 soil conservation districts in 36 states embracing an area of some 260,000,000 acres. Where resources were available, the districts received upon request such assistance as technical personnel, materials, equipment and labour for installing erosion control measures and devices from federal and state agencies. Some states made special appropriations for assisting these districts. Professionally trained personnel engaged in the mapping of soils and in developing farm conservation plans were supplied by the Soil Conservation service. In many states labour was provided by the Work Projects administration, the National Youth administration and the Civilian Conservation corps.

The Soil Conservation service was working in more than 500 selected areas throughout the country demonstrating effective erosion control practices. Also under the submarginal land utilization program, over 11,000,000 ac. of land unsuited for crop production were purchased from farmers and ranchers, retired from cultivation, and developed as pasture, range, forest, wildlife refuge and recreational areas. The government also made loans to farmers in semi-arid areas with which to set up water facilities, such as wells, pumps, stock-tanks and similar aids to good land use.

Altogether some 120,000 farms, covering 30,000,000 ac. in demonstration projects, CCC camp areas and other work areas, were in 1940 being treated to bring about complete erosion control. As a further encouragement to soil conservation, the Agricultural Adjustment administration made payments to farmers for adopting selected individual conservation measures. There were some 6,000,000 farmers participating in the crop adjustment program. From 1934 to 1940 farmers co-operating with the AAA have converted more than 30,000,000 acres from soil-depleting to permanent soil-conserving crops.

Throughout the United States, erosion-inducing practices, such as single cropping, up-and-down hill farming, overgrazing, and the burning of woodland and range lands, were replaced by soil-conserving practices. Soil-conserving crop rotations went into effect on an increasing area of land. Contour strip cropping, contour cultivation, reforestation, terracing, range development, meadow stripping, gully control and similar measures supplanted the more antiquated, destructive farming methods.

Canada.—Erosion in Canada reached its greatest proportions in the prairie provinces of Manitoba, Saskatchewan and Alberta. The problem, wind erosion, is somewhat the same as that which exists on the northern great plains of the United States. The prairie provinces passed legislation designed to help farmers and ranchers check wind erosion and correct land use conditions responsible for severe soil blowing. Alberta began in 1927 with the passage of an act providing for the removal of submarginal lands from cultivation. In recent years a series of laws have been passed by the three prairie province parliaments favouring conservation. Farmers received help in securing drought-resistant grasses and trees for shelterbelts and in developing water facilities for livestock and domestic uses. The conservation program in Saskatchewan resembled the program being carried out through the soil conservation districts in the United States.

In Mexico, erosion problems were mostly local in nature, some lands being excessively eroded while others were in excellent condition. The ancient custom of farmers living in villages and cultivating and grazing near-by areas explains this condition.

In South America, where some of the first outstanding erosion control devices in history were developed by the Incas—notably terracing and water diversion systems, whose monumental remains still stand—erosion by both wind and water reached such proportions as to attract governmental attention. In the central region of Chile there is much erosion in the arid coastal sections where land is not irrigated and where the slopes of the coastal mountains are exposed to the intense winter rains. Gullies are characteristic of the coastal slopes and of the wheat-growing sections, where clean plowing after harvest is practised. Excessive erosion in the rich agricultural areas in the south of Chile were reflected in greatly reduced crop yields. Experiment stations were established to study the erosion problem.

Recognizing the serious erosion problem in the Argentine, the national government on March 29, 1940 began an intensive educational campaign among the farmers "concerning the most adequate methods of cultivation leading to the conservation of fertility of the soil and the prevention of erosion or impoverishment." On July 17, 1940 the president of Colombia issued a decree creating protected forest zones on lands located at the headwaters of river basins, streams and ravines, and on margins and slopes with an incline greater than 40%. In the forests of the protected zones, penalties were levied for unauthorized felling of trees, grubbing or burning. In other South American countries erosion was recognized as a major problem but little national action was taken to prevent soil decline.

Europe.—In northwestern Europe, well distributed rainfall, lack of torrential rains and centuries of careful husbandry have preserved the fertility of the soils remarkably. The amount of erosion which does appear there is negligible: some sheet erosion in the high rainfall areas of Scotland and Wales, gully erosion in certain moraine areas of north Germany and on the slopes of the hill country, sheet erosion in the fine-sand areas in Brandenburg, and the shifting dunes in the Low Countries.

One of the most stupendous land reclamation projects ever undertaken is the draining of the Zuider Zee by the Dutch. Prior to the invasion by the Germans, more than 180,000 acres had been reclaimed and about one-third of it had been leased to farmers. On all reclaimed areas erosion control devices were established and the farmers were required to maintain them.

Erosion has for centuries exacted a heavy toll in some of the Mediterranean basin countries, due to the primitive methods of farming, the almost total absence of forests, and neglect of elaborate and ancient systems of stonewall terracing.

The destruction of vegetation and water conservation devices, such as cisterns and catchment basins, has resulted in the excessive depletion of soils in African lands bordering the Mediterranean.

Outside of Italy and the Italian and French mandates in northern Africa, very little effort at erosion control was made. In Italy a stupendous task of land reclamation and soil conservation has been going on since 1930. It was estimated, prior to Italy's entrance into the war, that one-third of the country would be improved under the Bonifica Integrale by 1944.

Centuries of deforestation and slope cultivation in Greece, together with the raising of goats, of which there are some 5,000,000 in the mountain regions, have resulted in one of the most serious erosion problems in the old world. The Greek government has taken steps to reduce the goat population systematically; reforestation and the channelling of flood streams are other major conservation devices.

Wind erosion is a serious problem on the plain of Hungary. Rapid deforestation of the Transylvanian Alps since the war of 1914–18 has contributed to the frequent flooding of the River Tisza and its tributaries. Erosion is progressing in the Rakovnik area of Bohemia and in the basin of the Borsary river in the Carpathian mountains.

Shifting sand dunes are a menace to agriculture in East Prussia and Poland. In eastern Poland, central Russia and the Ukraine, sheet and gully erosion are quite severe, while wind erosion on the steppes and the expanding area of drifting sand in south-central Asia add to the erosion problems of the Union of Soviet Socialist Republics. With extension of mechanized co-operative farms in semi-arid sections, the problem of wind erosion has greatly increased. Chief erosion control measures adopted by the soviet are the planting of shelterbelts and the development of drought-resistant grasses adaptable to the dry plains.

Orient.—The orient offers some of the most tragic results of erosion and some of the best examples of soil conservation. The land around the headwaters of the Yellow river in China is the most severely eroded region in the world, while the picturesque terraced hillsides of western China in the drainage of the Yangtze river, as well as terraced slopes in Japan, illustrate conservation at its best.

Continuous overgrazing has been largely responsible for much of the catastrophic erosion that scars the foothills of the Himalayas. Due to the lack of vegetation in the Punjab, the hills give rise to many violent torrents which, during summer floods, transport and deposit large quantities of silt and debris on the agricultural lands, causing considerable damage at the foot of the hills. Sauj Kas in Chakwal Teksil of Jhelum district is one of the destructive streams where counter-erosion works have started. On March 13, 1940 the central board of irrigation recommended to all provincial and state governments that they "develop and extend the most suitable local machinery to deal with further denudation" of Indian uplands.

For decades the Japanese have applied elaborate and systematic conservation methods so that in 1940 accelerated erosion was practically nonexistent on the farm lands of Japan.

Africa.—Countries of east Africa, where there is a similarity of topography, climate and customs, have about the same erosion problems.

In west Africa erosion has not been a serious problem. Primitive farming methods, the unsuitability of the region to white settlement, and the relatively small amount of livestock grazing due to the prevalence of the tsetse fly have preserved much of the tropical zone.

Australia.—In Australia, erosion by both wind and water has caused tremendous damage. Severe water erosion obtains in the Queensland cotton belt. Sheet erosion is widespread in Tasmania; the southern apple-growing districts are affected locally by severe water erosion. Wind erosion occurs in the semi-arid pastoral belt where the states border upon the central arid region of Australia and in the "bush country" of South Australia. Drifting of light sandy soils occurs on a large scale in some districts of South Australia, Western Australia, Victoria and New South Wales.

New Zealand.—The destruction of vegetation by high winds and overgrazing in the Kaimanawa mountains of New Zealand has led to severe erosion. (*See* also DROUGHT; DUST STORMS.)

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(H. H. BE.)

Soldiers' Bonus: *see* ADJUSTED COMPENSATION.

Solomon Islands: *see* PACIFIC ISLANDS, BRITISH; PACIFIC ISLANDS, MANDATED.

Somaliland, British: *see* BRITISH EAST AFRICA.

Somaliland, French: *see* FRENCH COLONIAL EMPIRE.

Somaliland, Italian: *see* ITALIAN COLONIAL EMPIRE.

South Africa, British: *see* BRITISH SOUTH AFRICAN PROTECTORATES.

South Africa, The Union of.

Area, 472,550 sq.mi. (incl. Walvis bay, 430 sq.mi.); pop. (est. June 30, 1939), 10,160,000 (Europeans, 2,116,500; native, 6,997,500; coloured, 814,800; Asiatic, 231,200). Chief towns (pop. census 1936): Cape Town (344,223); Johannesburg (519,384); Durban (259,606); Pretoria (128,621); Port Elizabeth (109,841). Governor general: Rt. Hon. Sir Patrick Duncan; languages: English, 39%; Afrikaans, 56%; religion: European population: Christian (Dutch Reformed Churches, 55%; Anglican, 19%; Methodists, 6%; Presbyterians, 5%).

History.—The union is a self-governing dominion of the British commonwealth of nations. The four provinces of which it consists, the Cape of Good Hope, Natal, the Transvaal and the Orange Free State, extend from the southernmost point of the African continent to the Limpopo in the north. The former German colony of South West Africa is administered under mandate as an integral part of the union. The seat of the government is at Pretoria; the seat of the legislature is at Cape Town.

The danger of a rebellion similar to that of 1914 was averted by the prudence of the opposition leaders and the prompt though lenient steps of the government against nazis and local blackshirt sympathizers in the union and South-West Africa. General J. B. M. Hertzog's followers joined the more numerous Nationalist following of Dr. D. F. Malan in a Reunited Nationalist or People's party. The party's demand for republican independence was weakened by memories of old feuds and the Hertzogites' lack of enthusiasm for secession or indeed controversy in wartime. It failed to reunite all the Afrikaners, a large and increasing number of whom supported Smuts side by side with the British section and the politically ineffective non-European majority. During the 1940 sessions (January–May and August–September), General J. C. Smuts had an average majority of 8 in the reconstituted senate and 20 in the assembly, while his policy was endorsed at a general election in South-West Africa (United party, mainly Afrikaners, 10; Nationalists, with German support, 2).

The German invasion of the kindred Netherlands left Nationalist opposition unchanged (May), while the entry of Italy into the war and the collapse of France (June) convinced them that Great Britain was doomed. Nazi aggression and the successful British stand lent weight to Smuts' plea that "neutrality is dead," and that the union must support Great Britain in a war which would decide the fate of Africa, a continent in which the union aspires to play a leading role. The assembly twice rejected Hertzog's motion for a separate peace (Jan. and Aug. 1940).

By the end of 1940 the union had not sent an expeditionary force to Europe as it did in the war of 1914–18, but had reorganized its defence force, developed home supply and raised a large volunteer mobile defence force for service "anywhere in Africa." On June 11 it declared war on Italy, sent its air and mobile forces into action on the Kenya-Somaliland frontier and stationed troops on its own eastern border to safeguard, if necessary, Portuguese Delagoa bay, the natural outlet of Transvaal traffic to the Indian ocean. It subscribed generously to funds for the aid of the British government and people and welcomed evacuated British children in spite of Nationalist grumbling at this alleged attempt to strengthen the British element.

The government controlled prices, converted a large loan from 5% to 3¾% and set up an Industrial Development corporation, financed in the first instance and controlled by itself, to encourage the secondary industries which were already co-operating with recruiting to check unemployment. The British government was buying the wool clip for the duration of the war and one year after and giving analogous help to maize and dairy producers, while the union and British governments together were helping fruit growers. Estimated revenue for 1940–41 was £54,902,000, including a small surplus, and expenditure, £57,255,000 including £14,000,000 for war purposes; nevertheless, more was to be spent than in the previous year on social services, including native education. The gap was to be filled mainly by £2,000,000 from loan account and a special levy on the gold mines in return for leave to sell gold at the enhanced world price which had risen from 148*s*. to 168*s*. per oz. since the outbreak of war.

No major government measure had to be shelved in spite of systematic Nationalist obstruction, though the "guillotine" had to be used for the first time to secure the passing of the War Emergency bill, condoning executive acts during the first four months of the war. The Electoral Laws Amendment act, long overdue, removed some of the handicaps on urban as against rural constituencies. (E. A. Wr.)

Education, 1937.—State and state-aided: European schools, 4,471; scholars, 381,550; native schools, 4,850; scholars, 546,225; higher, average number of students, 8,707.

Banking and Finance.—Revenue, ordinary (est. 1940–41), £54,902,000; expenditure, ordinary (est. 1940–41), £65,061,562; public debt (March 31, 1940), £290,400,000; notes in circulation (Feb. 2, 1940), £19,867,758; gold reserve (Dec. 31, 1939), £29,803,198; exchange rate (1938), £100.5 S.A.=£100 sterling.

Trade and Communication.—External trade (exclusive of goods in transit and of gold bullion and specie): imports (total, 1939), £91,341,108; (Jan.–June 1940). £53,566,842; exports (domestic, 1939), £34,143,132; (Jan.-June 1940), £18,898,233. Communications and transport: roads fit for motor traffic (1937–38), 85,428 mi.; railways, including S.W. Africa (March 31, 1939), 13,642 mi.; airways, including S.W. Africa (1938–39); passengers carried, 37,053; freight, mails and luggage carried, 4,468,903 lb.; mileage flown, 1,988,664; shipping (1939) entered, 6,040; net tonnage, 24,699,753; cleared, 6,017; net tonnage, 24,627,778. Motor vehicles licensed (Dec. 31, 1939): cars and taxis, 318,628; buses, 1,763; vans and lorries, 50,249; tractors, 1,087; cycles, 23,452; wireless receiving set licences (1938), 189,321; telephones, instruments in use (1938), 175,711.

Agriculture, Manufactures, Mineral Production.—Production (in metric tons): gold (1939), 12,819,344 fine oz.; diamonds (1939), 1,269,828 metric carats; maize (est. 1939–40), 1,886,910; coal (1939), 21,524,890; sheep, number (Aug. 31, 1938), 39,001,481; cattle, number (Aug. 31, 1938), 11,371,733; wool (est. 1940–41), 122,954; wheat (1938–39), European cultivation, 465,200; cane sugar (1938–39), refined, 472,600; iron ore (metal content) (1938), 320,000; pig iron and ferro-alloys (1938), 294,400; steel (1937), 284,000; silver (1938), 1,135,374 fine oz.; manganese ore (metal content) (1938), 238,600; chrome ore (chromic oxide content) (1938), 79,400; asbestos (1938), 21,900; wine (1937–38), European cultivation, 347,091 hectolitres; tobacco (1937–38), European cultivation, 9,236; potatoes (est. 1939–40), European cultivation, 154,500; oats (1937–38), European cultivation, 86,158; barley (1937–38), European cultivation, 25,809; mohair (1938), export, 1,900; copper (smelter production) (1938), 11,100; ground-nuts (est. 1939–40), European cultivation, 9,680; benzol (1938), 1,900; superphosphates of lime (1937), 164,000. Industry and labour: (census, 1936–37) establishments, 9,987; employees, European, 140,203; others, 192,565; value of gross output, £172,863,087; value of net output, £79,931,813. Employment index, European (average, 1925=100), average, 1939, 177·0.

South America: *see* Argentina; Bolivia; Peru; etc.

South Australia. A state of the Australian commonwealth, 380,070 sq.mi. in area, bounded by longitudes 129° E. and 141° E., and by latitude 26° S. and the southern coast of the continent. The state governor is Sir Charles Malcolm Barclay-Harvey, K.C.M.G. Population (est. Dec. 31, 1939) 597,045. Chief town and capital (pop. Dec. 31, 1939), Adelaide (322,990).

History.—Since the outbreak of war, large commonwealth government contracts had been let for the construction of extensive defence works in South Australia. The Imperial Chemical Industries' works at Outer Harbour reached production stage with output undergoing a testing period. The principal products are soda ash, bicarbonate of soda and calcium chloride and when full production was achieved the works were expected to supply the whole of the Australian market.

During the year the barrages at the mouth of the river Murray which stretch across various arms of the river were completed. This work, which had taken five years, marked the completion of the River Murray scheme initiated 25 years before and which cost a total of £A12,000,000.

The government amended the regulations under the Education act to exempt all pupils up to the age of 15 years from the payment of fees for high school, junior technical schools and day school education. Free education which had been afforded to all school children up to the compulsory school-leaving age of 14 was thus extended for 12 months.

Finance.—In 1939–40: revenue, £A12,755,648; expenditure, £A12,918,376; debt outstanding (Dec. 31, 1939) £A111,167,864.

Communications.—Roads (March 30, 1940) 23,032 mi. fit for motor traffic; railways (1939) government 2,558 mi. Motor vehicles licensed (Dec. 31, 1939): cars 59,345; trucks 25,740; cycles 9,492. Wireless set licences (Dec. 31, 1939) 120,584.

Agriculture and Manufactures.—Wheat (1939–40) 40,984,000 bu.; barley (1939–40) 9,250,000 bu.; grapes (1938–39) 150,608 tons; currants (1938–39) 191,381 cwt.; wool 1938–39) 102,888,121 lb.; butter (1938–39) 20,594,223 lb. Industry, 1939: factories 2,067; employees 43,371; gross value of output £A35,005,254; unemployment (1938–39) 9·4%. (W. D. Ma.)

South Carolina is an Atlantic coast state of the United States and one of the original thirteen. It has an area of 30,989 sq.mi., including almost 500 sq.mi. of coastal waters. Population 1940, 1,899,804, a decennial increase of 9·3%; Columbia, the capital, 62,396; Charleston, 71,275. Urban population 24·5%, as against 21·3% in 1930.

History.—Gov. B. R. Maybank continued to urge state police to supplement antiquated local law enforcement, diversion of part of abundant road support from gasoline tax to general purposes so as to avoid increasing general taxes, and a constitutional convention to modernize the constitution especially as to taxation. A few K.K.K. parades and whippings brought several prosecutions. South Carolina voted 95% Democratic in the 1940 national election, giving Roosevelt 95,470 votes and Willkie 4,360. The people voted for biennial (instead of annual) legislative sessions and for prohibition, actions to be ratified or ignored by the 1941 legislature. Large army training camps were located at Columbia and Spartanburg. A coastal hurricane of Aug. 11 killed 35 or 40 persons and wrecked about $3,000,000 worth of property.

Education.—Whites in public schools in 1938–39, 266,882; Negroes 220,728; expenditures, respectively, $15,952,094 and $2,502,437. National Youth administration aided college students in 1939–40, $191,265, and high school students, $232,416.

Charities, Corrections and Social Legislation.—On June 30, 1940, the state hospital (for insane) contained 4,529 patients and 807 more were on parole. The state penitentiary that day held 1,338 convicts. Many prisoners of all grades (except those personally desperate) are on county chain gangs. Executions for the year ending June 30, 1940, 5 (previous year 10). The department of public welfare distributed (1939–40) in money and supplies to children, the aged, the blind, etc., $6,030,635, of which all but $1,413,600 came from federal funds. The S. C. Unemployment Compensation commission paid $2,327,164 in benefits in same 12 months. On June 30, 1940, 6,308 miles of paved highways were in use and 290 miles under construction.

Finance.—The state government's receipts year ending June 30, 1940, totalled $66,197,575. This included about $18,000,000 raised by fees and taxes for general purposes; $13,117,313 gasoline taxes for roads; about $4,008,000 from the federal government and large sums borrowed to pay off maturing notes or bonds. The court's annulling the attempted transfer of $2,000,000 gasoline taxes from roads to general purposes as violating the pledge of those taxes for service of the road bonds (though the tax income had risen much above that necessity) left a deficit in general funds of about $2,809,000. Total state debt for highways June 30, 1940, was $62,912,534 (of which $16,903,534 was for reimbursing counties). Other state debt equalled $7,926,137. Federal internal revenues from S. C., year ending June 30, 1940, totalled $10,955,057. Exports totalled $9,270,091 and imports $7,866,492, duties on the latter being $1,358,635.

Agriculture and Manufactures.—Agriculture somewhat improved, but lagged behind manufacturing. The total value of crops in 1940 was $121,624,000, being 6% above the five-year average. The 970,000 bales of cotton showed the largest yield per acre in the state's history, as was true also of tobacco. Wheat (the largest crop on record) equalled 2,688,000 bu. and corn 24,304,000 bu. Nine counties had fewer farms than in 1930 and 13·7% of all farms had electric service. In 1940 6,676,000 ac. of forest were under co-operative state and private protection. The two federal forests totalled 2,016,234 ac., 658,236 being federally owned. Investment in manufactures totalled $406,211,667, textiles representing $204,103,617; value of products $446,083,566 and $290,094,123, respectively; wages (not including salaries), $100,021,714 and $73,475,819, respectively. Employment of approximately 25,000 men on government camps and power developments and decided business revival in general greatly reduced unemployment. (D. D. W.)

South Dakota, west north central state, admitted to the union Nov. 2, 1889, is generally called the "Coyote State." Area, 77,615 sq.mi. Population (1940 census), 642,961; urban pop., 158,087; rural pop., 484,874. Capital, Pierre (pronounced "Peer"); pop., 4,322. Chief city, Sioux Falls; pop., 40,832. Indian pop. (1939), 28,578.

History.—In general election of Nov. 5, 1940, Republicans retained complete control of state government and state's two congressional seats. Willkie carried the state 177,065 to 131,362 for his largest percentage in the nation. The state officials elected in Nov. 1940 were: governor, Harlan J. Bushfield*; lieut. gov., A. C. Miller; secretary of state, Miss Olive A. Ringsrud*; state auditor, W. W. Warner*; state treasurer, W. G. Douglas*; commissioner of schools and public lands, Earl A. Hammerquist*; attorney-general, Leo A. Temmey*; supt. of public instruction, John F. Hines*; public utilities commissioner, C. L. Doherty*; judges of supreme court, H. B. Rudolph* and St. Clair Smith* (* shows re-election).

Formal programs were held to mark the centenary of the first Catholic services in the trans-Missouri region in South Dakota by Father Christian Hoecken in June 1840, and the centennial of the first Protestant sermon in the state by Dr. Stephen R. Riggs in Sept. 1840.

Statistics.—The school census for 1940 was 186,251; school enrolment, 136,447. On June 30, 1940, the state's bonded debt was $43,294,000. Total receipts, $29,704,910.14; disbursements, $26,845,889.12. Total crop value, $85,322,000.

South Dakota's rank among states in 1940 in crop production was: second in durum wheat; third in barley and rye; fourth in other spring wheat, sweet sorghum and wild hay; fifth in flax; sixth in oats, and thirteenth in corn and all wheat.

The mineral production, principally gold from Homestake mine (Lead, S.D.), was more than $20,000,000. (L. K. F.)

Southern Rhodesia: *see* RHODESIA.
South Polar Regions: *see* EXPLORATION AND DISCOVERY.

South Sea and Equatorial Islands. Howland island lies in the Pacific ocean, approximately 1,870 mi. southwest of Honolulu, in latitude 0°–48′–06″ N. It was surveyed in 1872 by the U.S.S. "Narragansett" and found to be about 2 mi. long, ½ mi. wide, 20 ft. above sea level at its highest elevation, of coral formation and with a fringing reef.

Baker island is in the Pacific ocean in latitude 0°–13′–30″ N., longitude 176°–28′–14″ W., approximately 1,880 mi. southwest of Honolulu, and within 13 nautical miles of the equator. It is of coral formation, about 1 mi. long east and west, and ¾ mi. wide, surrounded by a coral platform reef 200 to 400 ft. wide. Its highest point of elevation above sea level is 20 ft.

Jarvis island is in the Pacific ocean, approximately 1,500 mi. south of Honolulu, in latitude 0°–22′–37″ S., longitude 160°–01′–37″ W., 23 mi. south of the equator. It is of sand and coral formation, approximately 2 mi. long and 1½ mi. wide, and about 20 ft. above sea level at its highest point.

These three islands were settled in 1936, after having been uninhabited for many years. Representatives of the department of the interior placed four young Hawaiians on each island to maintain sovereignty of the United States and to obtain meteorological data essential to commercial aviation in the Pacific. United States citizens of Hawaiian ancestry were selected because of their adaptability to prevailing conditions and their proximity to the islands. The scarcity of vegetation and the absence of drinking water make it necessary to transport food, water and other supplies from Honolulu. This is accomplished by quarterly expeditions to the islands by coast guard cutters.

Canton island is the largest and most northerly of the Phoenix islands. It is approximately 1,850 mi. southwest of the Hawaiian group in latitude 2°–48′–58″ S., longitude 171°–42′–41″ W. It is a coral atoll containing a narrow strip of land varying from 50 to 600 yd. in width, enclosing a lagoon about 9 mi. long and 3 mi. wide at the west end. The rim varies in height from 10 to 20 ft. and is broken only by three or four lagoon entrances.

An air base has been established on Canton island by Pan American Airways in connection with its service from California to New Zealand. A hotel and other necessary facilities are now in operation, and regular aviation service was started with the first air mail flight from California on July 12, 1940. With the agreement of the state department, the interior department and the Civil Aeronautics authority, a member of the Pan American staff on Canton island has been designated acting field representative

of the interior department, serving without compensation. The Hawaiian colonists were evacuated Oct. 8, 1940.

Canton and Enderbury islands are under the joint control of the United States and Great Britain, under an agreement completed in April 1939 between the two governments, providing for the common use of the islands for international aviation and communication for a period of 50 years. (R. Em.)

South-West Africa: *see* Mandates; South Africa, The Union of.

Sovereigns, Presidents and Rulers.

The following list includes the names of those holding chief positions in their countries at the beginning of 1941.

Country	*Name and Office*	*Accession*
Afghanistan	Muhammed Zahir Shah, King	1933
Arabia, Saudi	Abdul Aziz ibn Sa'ud, King	1926
Argentina	Ramón S. Castillo, Acting President	1940
Australia	Lord Gowrie, of Ruthven, Governor General	1936
	Robert G. Menzies, Premier	
Belgium	Leopold III, King (German occupation)	1934
Bhutan	Yigme Wangchuk, Maharaja	1926
Bolivia	General Enrique Penaranda, President	1940
Brazil	Dr. Getulio Vargas, President-dictator	1930
Bulgaria	Boris III, King	1918
	Bogdan Philoff, Prime Minister	
Burma	Sir Archibald D. Cochrane, Governor	1936
	U. Saw, Prime Minister	1940
Canada	Earl of Athlone, Governor General	1940
	W. Mackenzie King, Prime Minister	
Chile	Pedro Aguirre Cerda, President	1938
China	Lin Sen, Chairman of National Gov't	1932
	Gen. Chiang Kai-shek, President of Executive Yuan	1939
Colombia	Dr. Eduardo Santos, President	1938
Costa Rica	Rafael A. Calderon Guardia, President	1940
Cuba	Col. Fulgencio Batista, President	1940
Denmark	Christian X, King (German occupation)	1912
Dominican Rep.	Manuel de Jesus T. de la Concha, President	1940
Ecuador	Carlos Arroyo del Rio, President	1940
Egypt	Farouk I, King	1936
	Hussein Sirry Pasha, Premier	
Eire	Dr. Douglas Hyde, President	1938
	Eamon de Valera, Premier	
Finland	Risto Ryti, President	1940
France	Henri Philippe Pétain, Premier and Chief of State	1940
Germany	Adolf Hitler, Fuehrer and Reich Chancellor	1933
Great Britain	George VI, King and Emperor	1936
	Winston Churchill, Prime Minister	
Greece	George II, King	1935
Guatemala	Gen. Jorge Ubico, President	1931
Haiti	Stenio Vincent, President	1930
Honduras	Gen. Tiburcio Carias Andino, President	1933
Hungary	Admiral Nicholas Horthy, Regent	1920
	Count Pal Teleki, Premier	
Iceland	Christian X, King (British occupation)	1912
India	Marquess of Linlithgow, Viceroy, Governor General	1936
Iran	Reza Pahlevi, Shah	1926
Iraq	Feisal II, King (Regency)	1939
Italy	Victor Emmanuel III, King	1900
	Benito Mussolini, Premier, Chief of Gov't, Sec'y of State	
Japan	Hirohito, Emperor	1926
	Fumimaro Konoye, Premier	
Liberia	Edwin Barclay, President	1930
Liechtenstein	Franz Joseph II, Sovereign Prince	1938
Luxembourg	Charlotte, Grand Duchess (German occupation)	1919
Manchoukuo	Henry Pu Yi, Emperor Kangte	1934
Mexico	Manuel Avila Camacho, President	1940
Monaco	Louis II, Prince	1922
Morocco	Sidi Maulay Mohammed, Sultan	1927
Nepal	Maharajah Sir Joodha Shamsher Jung Bahadur Rana, King	1940
Netherlands	Wilhelmina, Queen (German occupation)	1890
Newfoundland	Sir Humphrey T. Walwyn, Governor	1936
New Zealand	Sir Cyril Newall, Governor General	1940
	Peter Fraser, Acting Prime Minister	
Nicaragua	Gen. Anastasio Somoza, President	1937
Norway	Haakon VII, King (German occupation)	1905
Oman	Sir Sayyid Said bin Taimur, Sultan	1932
Palestine	Sir Harold Alfred MacMichael, High Commissioner	1938
Panama	Arnulfo Arias, President	1940
Paraguay	Higinio Morínigo, Provisional President	1940
Peru	Dr. Manuel Prado y Ugarteche, President	1939
Philippines	Manuel Quezon, President	1935
Portugal	Gen. Antonio Carmona, President	1926
	Dr. Antonio Salazar, Premier	
Rumania	Mihai, King	1940
	Ion Antonescu, Premier-Dictator	
Russia	Mikhail Ivanovich Kalinin, President	1936
	Joseph V. Stalin, Communist Secretary	
Salvador, El	Gen. Maximiliano Hernández Martínez, President	1935
Siam (Thailand)	Ananda Mahidol, King (Regency)	1935
	Col. Luang Bipula Songgram, Premier	
Slovakia	Joseph Tiso, President	1939
South Africa	Sir Patrick Duncan, Governor General	1937
	Gen. Jan C. Smuts, Premier	
Spain	Gen. Francisco Franco, Chief of State, Prime Minister	1939
Sudan	Lt. Gen. H. J. Huddleston, Governor General	1940
Sweden	Gustaf V, King	1907
Switzerland	Dr. Ernst Wetter, President	1941
Syria, Lebanon	Henri Dentz, High Commissioner	1940
Trans-Jordan	Abdullah ibn Hussein, Emir	1928
Tunis	Sidi Ahmed II, Bey	1929
Turkey	Ismet Inonu, President	1938
United States	Franklin D. Roosevelt, President	1933
Uruguay	Gen. Alfredo Baldomir, President	1938
Vatican City	Pius XII, Pope	1939
Venezuela	Gen. Eleazar López Contreras, President	1935
Yugoslavia	Peter II, King (Regency)	1934
Zanzibar	Seyyid Sir Khalifa bin Harub, Sultan	1911
	Henry Guy Pilling, British Resident	1939

Soviet-German Pact: *see* Chinese-Japanese War: *Europe and the Far East;* Italy; Molotov, Vyacheslav Mikhailovich.

Soviet Republics: *see* Union of Soviet Socialist Republics.

Soviet Union: *see* Union of Soviet Socialist Republics.

Soybeans.

Urgent need for edible fats and oils gave impetus in 1940 to European and Asiatic production of soybeans, an important food and feed crop in the United States and Europe but grown in these countries only to a minor extent until a few years ago. Acreage was greatly increased in the Danube basin, the principal European production area. In Manchoukuo, the world's largest producer, government regulations compelled thorough harvesting from a smaller acreage. Manchoukuoan farmers, reports the United States agricultural attaché at Shanghai, "will have preferential rights to obtain necessities when they have complied with the government's crop collection campaign." As a result the 1940 Manchoukuoan crop of soybeans was 161,156,000 bu. from 9,454,000 ac., compared with 144,952,000 bu. from 10,827,000 ac. in 1939, the Manchoukuoan ministry of industry estimated. In the United States, the second largest producer, estimated harvest from soybeans was 81,541,000 bu. from 5,011,000 ac., compared with 87,409,000 bu. from 4,226,000 ac. in 1939. Rumania lost 80% of its soybean acreage in 1940 by the ceding of Bessarabia to Russia. The Rumanian five-year plan, published in the spring of 1940, specified the year's soybean planting at 395,360 ac., comparable with 256,000 ac. in 1939. With the loss of Bessarabia, the acreage was reduced to 54,000 ac., with an estimated yield of 704,000 bu. as against 3,532,000 bu. in 1939. No figures are available from Russia. The Rumanian government fixed the price to farmers at $1.50 per bu. Bulgaria increased the 1940 planting to 99,000 ac., from 44,000 in 1939. The 1940 crop was estimated at 1,415,000 bu. compared with 613,000 bu. in 1939. The fixed price was $1.81 per bu. Bulgaria announced a larger acreage for 1941 owing to increased demand from Germany. Owing to the British blockade's preventing the importation of oilseeds from Asia and Africa, Hungary increased the 1940 acreage to 12,000 ac., from 7,000 in 1939, with a 194,000 bu. crop in 1940, against 125,000 bu. in 1939. All soybeans produced in Hungary were converted into food for the army. The fixed price was raised successively

Soybean Production by Principal States, 1940 and 1939

	1940 bu.*	1939 bu.	1929–38 average, bu.
Illinois	39,420,000	45,423,000	14,784,000
Iowa	13,680,000	10,227,000	2,714,000
Indiana	10,439,000	13,962,000	4,016,000
Ohio	8,670,000	9,681,000	1,713,000
North Carolina	2,422,000	2,012,000	1,341,000
Missouri	1,067,000	970,000	746,000
Other states	5,843,000	5,134,000	2,004,000

*A bushel of soybeans weighs the same as a bushel of wheat, 60 pounds.

in 1940 from $1.20 to $1.44 to $1.66 per bu. The Yugoslav crop in 1940 was estimated at 294,000 bu. from 21,000 ac., compared with 103,000 bu. from 16,000 ac. in 1939. The government-fixed price was $1.47 per bu. An unfavourable growing season reduced production from the record acreage in the United States in 1940. (*See* also CHEMURGY.) (S. O. R.)

Spain, republic of southwestern Europe, a totalitarian state; capital, Madrid; area 194,200 sq.mi. (including Balearic and Canary islands); pop. (gov't est. June 1940) 26,053,230 (1930 census) 23,563,867. Chief towns (pop. est. 1940): Barcelona 1,398,942; Madrid 1,194,756; Valencia 403,126; Seville 253,203; Malaga 232,136; Bilbao 228,418. Caudillo, or chief of state: General Francisco Franco; language: Spanish; state religion: Roman Catholic.

History.—Spain's chief concerns in 1940 were socio-economic rehabilitation and the achievement of political solidarity. The promised millennium was far from achieved, and the Franco dictatorship encountered not only bitter Republican discontent but increasing Conservative dissatisfaction as well. Climaxing extensive arrests and convictions of Republicans after the nationalist victory in 1939, a decree was issued in March 1940 which outlawed Freemasonry and secret societies and declared Freemasons (as well as Communists, anarchists, etc.) subject to imprisonment and other sanctions. In that it invited retractions, this decree held promise of greater leniency, as had the provision in January for judicial review of the sentences of military tribunals. Nevertheless, 500,000 Republicans were reported under arrest at midyear and executions continued at a rate estimated as high as 20 to 30 a day. Among prominent Republicans executed were Luís Companys, former president of the Catalonian republic and Julian Zugazagoita, interior minister in the Republican government of Dr. Juan Negrín. Of Republican refugees in France, an estimated 340,000 had been repatriated by March, while thousands migrated to American countries, especially Mexico, which, in an agreement signed with France and approved by the axis powers, undertook to promote the transfer of the remaining 80,000 or more to the western hemisphere.

SPAIN'S FASCIST GOVERNMENT decided in 1940 to leave the Toledo Alcázar in ruins as a monument to the Nationalists' successful resistance to a 71-day siege at the beginning of the civil war in 1936

Domestic politics were further complicated by the problem of reconciling the divergent groups supporting the Franco government: the fascist F.E.T. (*Falange Española Tradicionalista*) and the conservative, "traditionalist" element represented by the army, church, monarchists and great landholders. Throughout 1940 the Falange remained politically dominant, with its national council (membership 100) constituting the legislative body and its 19-man political junta serving practically as the government cabinet. At the beginning of 1940 the Falange was presumably working in complete accord with the army, which had been granted affiliated membership in the F.E.T. Their uncertain relationship was indicated, however, by the dismissal, in March, of General Múñoz Grande from the secretary-generalship of the Falange and his ex officio cabinet post, and by analogous cabinet changes later in the year. In August the F.E.T. militia was reorganized to enable collaboration with the army in the compulsory military service program and, in December, the Falange took full charge of the political and premilitary training of Spanish youth.

The Franco administration rewarded the church with an annual grant of 62,900,000 pesetas, provided for its participation in education, fostered the rebuilding of churches, returned confiscated Jesuit properties and annulled civil marriage and divorce. Concessions, however, were more apparent than real and the government interposed its iron hand in clerical as well as in secular affairs. Church interference in politics was discountenanced and papal pretensions to the appointment of Spanish bishops rigidly opposed. Monarchists, weakened by divided loyalties, enjoyed considerable prestige but not the extensive privileges anticipated. As a conciliatory gesture to great landowners, lands expropriated under the agrarian laws of 1932 and 1935 were restored to their former proprietors; areas needed for irrigation and drainage projects were expressly exempted, however, and provision was made to prevent the immediate displacement of actual holders of the land.

The most urgent social problem was the shortage of food. Bread and other essential foods were being rationed late in the year, and, despite government anti-profiteering measures, prices ranged from 50% to 200% greater than in 1936. Immediate relief needs were met by the *Auxilio Social*, Falange women's organization, whose activities tended to relax traditional Spanish restrictions upon women. In an effort to increase cultivation, the government provided in Jan. 1940 for an unlimited number of drainage and irrigation projects in which land would be worked by either private or government sponsored societies. A ten-year program of material reconstruction was likewise announced in January, envisaging the expenditure of 4,200,000,000 pesetas—1,650,000,000 pesetas each for hydraulic projects and highway-railroad repairs, and the remainder for harbour improvements.

Nationalist Spain's politico-economic structure is patterned after that of Portugal and Italy, with rigid government control of industry along lines conducive to national self-sufficiency. In accordance with the Syndical Unity law of January, vertical industrial syndicates embracing both executives and workers were

gradually affiliated with one major syndical organization under the F.E.T. Strikes and lock-outs were prohibited and labour assured a minimum wage and an eight-hour day. A noteworthy feature of economic reorganization was the shifting of light industries from Catalonia and the Basque country to agricultural central Spain; this was in conformity with the government's campaign against Catalonian and Basque autonomist tendencies.

Developments in Spain's pro-axis foreign policy were shaped by both domestic exigencies and the kaleidoscopic international scene. Early in the year neutrality was maintained with respect to the European war, but axis military successes soon encouraged a more vigorous stand. On June 12, two days after Italian entrance into the war, Spain declared its "non-belligerency," and on June 14 Spanish troops occupied the International Zone of Tangier (although formal control was not announced until Nov. 4). Meanwhile agitation began for further North African expansion and the occupation of Gibraltar. On Oct. 18 dramatic emphasis was given the pro-axis trend when Ramón Serrano Súñer, General Franco's strongly fascist brother-in-law, was appointed foreign minister, succeeding General Juan Beigbeder Atienza, who, in common with many army generals and other "traditionalists," was reported to favour a less aggressive international policy; the new foreign minister continued as head of the political junta but surrendered his important interior ministry to the caudillo himself. Spanish-axis accord was further signalized by Serrano Súñer's visits to Berlin and Rome in September and November, General Franco's meeting with Adolf Hitler at the Spanish frontier in October and the visit to Spain in the same month of Heinrich Himmler, nazi gestapo chief. Spanish belligerency was momentarily expected but failed to materialize. In the latter part of the year expressions of anti-British feeling became somewhat less violent as negotiations were opened with Great Britain and the United States in an effort to procure vital foodstuffs and other commodities. Meanwhile, Spain vigorously championed the "spiritual unity of the Hispanic world," an ideal linked with its generally hostile attitude toward the United States. Diplomatic relations with Chile, which had been severed in July because of that country's pro-Republican sympathies, were restored on "The Day of the Race" (Oct. 12).

Banking and Finance.—The peseta was valued at 9.13 cents; gold reserves were almost negligible, and the currency was artificially controlled. A deficit of more than 8,000,000,000 pesetas accrued during the Spanish Civil War, to which another 2,600,000,000 deficit was added by Jan. 1940, bringing the national debt to almost 25,000,000,000. Ordinary budget appropriations for 1940 totalled 5,960,245,000 pesetas (almost 25% higher than the pre-Civil-War budget), and the extraordinary budget (an innovation), 1,200,977,000; 1,500,000,000 went for defence and only 882,000,000 for agriculture, education and public works combined. Government receipts were about 3,000,000,000 pesetas for the first half of 1940. In December, the entire internal tax structure was revised, bringing an extension of the sales tax and increased levies on luxuries, landed estates, unearned income and inheritances.

Trade and Communications.—Internal communications suffered severely during the Civil War. Post-Civil-War valuations (in millions of pesetas) of railroads were 3,965, motor vehicles 288 and merchant marine 210, nearly a 40% average decline. River and air transport facilities were negligible even before the Civil War. Determining factors in Spain's sharply decreased foreign trade were the exchange shortage, leading to a bilateral compensation policy, and the European war, which restricted markets, supply sources and shipping facilities. Statistics published in mid-1940 covering April-Dec. 1939 showed imports valued at $111,978,000 ($286,940,000 in 1935) and exports at $78,287,000 ($190,613,000 in 1935). Foodstuffs comprised 42% of imports (14% in 1935), with wheat alone accounting for more than 25%, and cotton, normally the top-ranking item, declining to only 3.5%; Argentina contributed 27.9% (2.5% in 1935), the United States 14%, Germany 12.9%, the United Kingdom 5.1% (10.4% in 1935) and France 1.7% (5.5% in 1935). Exports changed little in composition, with foodstuffs and raw materials (chiefly oranges and other fruits, nuts, olives and olive oil, cork and its manufactures, iron ore and pyrites, mercury and naval stores) accounting for about 85%. Principal markets (with percentages of exports taken) were the United Kingdom (25.4), Germany (24.8, as compared with 12.7 in 1935), the United States (10.1) and Italy (6.2). In 1940 the extension of the war and the British blockade further restricted external commerce, but the collapse of France re-opened continental trade channels which hostilities had earlier closed. Argentina remained the principal exporter to Spain.

Agriculture and Industry.—The chief industry is agriculture, although less than half the arable land is under cultivation; main products are grains, olives, grapes and citrus and other fruits. Minerals are abundant, including iron ore, copper, manganese, lead, mercury and potash salts. In 1939 and 1940 industrial recovery was retarded by serious shortages of raw materials (cotton, fertilizers, fuels, hides), machinery and other capital equipment and skilled labour. Agricultural production in 1940 generally gained over 1939, with notable increases in the case of rice (nearly normal, and 92% more than in 1939) and olives (expected to provide an exportable surplus of 100,000 metric tons); wheat output, about 80% of normal, was greatly inadequate for domestic needs.

Textile production in 1939 was only 35% of normal, steel 60%, cement 50%, tanning and shoes 40%, paper 65% and fertilizers and heavy chemicals 50%.

(*See* also EUROPEAN WAR; MINORITIES.)

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Spanish-American Literature.

Outstanding in Argentina's literary contribution of 1940 were some interesting books considering the composite elements that constitute that nation, attempting to define a doctrine of national existence and trying to foresee the nation's future development: *Meditación en la costa* by Eduardo Mallea, *Meditación argentina* by Carlos Alberto Erro, *La muerte del indio. Elogio de la raza nueva* by Félix Esteban Cichero.

Venezuela gave one of the most significant books of the year: *1941. Cinco discursos sobre pasado y presente de la Nación venezolana* by Mariano Picón Salas. In view of the 1941 presidential election, Picón Salas called on the youth of Venezuela to bring forth a national reorganization after the many years of brutal dictatorship suffered by the country, threw the light of his keen intellect on all national problems and formulated a plan for democratic reconstruction.

Important also were *¿Qué haremos con la historia?* by the Colombian writer Germán Arciniegas and the lucid Ecuadorian books *El sentido histórico y la cultura* by Dr. Julio E. Moreno and *Años de oprobio* by Dr. Gualberto Arcos.

Looking to their historical background, the Spanish-Americans proceeded during 1940 in their work of re-creation of their history. Bolívar, as usual, was the subject of several books among which may be cited *El superhombre. Vida y obra del Libertador* by J. A. Cova and *Viaje stendhaliano. Tres ensayos sobre la psicología amorosa del Libertador* by Luis Correa. The centennial of General Santander was the occasion for the publication of numerous works about him, the most interesting being *Santander* by Fernando González and *El hombre de las leyes* by Max Grillo.

Of both historical and literary value was a *Martí, hombre* by Gonzalo de Quesada y Miranda, the son of the Cuban hero's secretary. An excellent work was the systematic and complete book by F. Romero, A. Vasallo and L. Aznar on the Argentinean philosopher *Alejandro Korn.*

In the field of literary research and criticism 1940 was a fruitful year. Gerardo Seguel's *Alonso de Ercilla* studied the poet as the founder of Chilean poetry and thought. Important was the second edition, published in 1940, revised and enlarged, of Carlos González Peña's *Historia de la literatura mejicana.* Important also was the augmented second edition of Luis Alberto Sánchez's *América. Novela sin novelistas.* In opposition of views to the latter was *Novelistas hispanoamericanos* by Professor Arturo Torres Ríoseco. Prof. Torres, who in 1939 published *La novela en la América hispana,* dealing with the history of the novel and the different novelistic schools in Spanish-America, studied in his latest book, with his usual insight and independent criticism, the personality and the works of the most distinguished Spanish-American novelists. Hernán Díaz Arrieta published an interesting monograph on *Don Alberto Blest Gana.* Marcelo Olivari's *Lugones* is a critical biography of the late Argentinean poet.

Essays on letters, arts, philosophy, were in 1940 to be found in *Textos y pretextos* by Xavier Villaurrutia; *Imagen del teatro. El teatro por dentro,* on the Mexican theatre, by Antonio Magaña Esquivel; *Panorama del nuevo teatro by* José Mª Monner Sans; *Fanatismo y misticismo,* with a good study on surrealism, by Adolfo Menéndez Samará; *Mitos, mujeres y encajes* by Antonio Reyes; *Mensajeros del ideal* by Néstor Bermúdez; *Villa de la Unión* by Alfonso Reyes; *La flecha en el arco* by Emilio Rodríguez Mendoza; *Significación de las cosas* by Carlos René Correa; *Diecisiete divagaciones* by Misael Chavarri; *Jesús* by Ricardo Davila Silva.

Worthy of the reputation of Pedro Henríquez Ureña, the Dominican scholar, was his 1940 book *Plenitud de España,* studies in the history of culture.

In the field of fiction, Mexico's Mariano Azuela published *Avanzada,* a good novel, in vivid and rugged style. Other Mexican novels of the year were *Paludismo* by Bernardino Mena Brito, and *Caos* by A. Izquierdo Albiñana. The group of Ecuadorian novels, so distinctive in Spanish-American literature, was augmented in 1940 by *Trabajadores* by Humberto Salvador, *Pinceladas de la tierruca* by Alejandro Andrade Coello, and *Sumag Allpa* by G. Humberto Mata. The Peruvian writer, Rosa Arciniega, published *Playa de vidas* in subjectivist mood. In Chile, *Cien mil palabras* by Jacobo Nazaré was a good novel of social significance. A curious work was the Bolivian novel *Puna* by Hugo Blym. The outstanding Argentinean novel of 1940 was Adolfo Bioy Casares' *La invención de Morel,* fantastic and anti-psychological.

On the short story shelf might be found the interesting *Cuentos negros de Cuba* by Lydia Cabrera; *Paseo de mentiras* by Juan de la Cabada, good in landscape and in psychology; *Sombra* by Arturo Martínez Galindo; *Multitud,* well written short stories by Humberto Jaramillo Angel; *Dos novelas cortas* by Joaquín González Eiris; *Pichamón* by Leoncio Guerrero, stories of the Maule region in Chile, of the "criollista" school; *Consejas del Gran Río* by Edmundo de la Parra, strange tales of the Bío-Bío; *Kupen. Cuentos de la Tierra de Fuego* by Enrique Campos Menéndez. An *Antología del cuento hispanoamericano* was published by Antonio R. Monzor.

Poetry blossomed in 1940. Enrique Gonzàlez Martinez published the third volume of his *Poesía.* Other books of poetry published in 1940 included *Cantos de la tierra prometida* by Juan Cotto, the Salvadorian poet recently deceased; the pastic *Tierra marinera* by Fernando Luján; *Mástiles al sol* by Gregorio Castañeda; *Cuatro poemas* by the distinguished Cuban poet Eugenio Florit; *Ya viene la primavera* by Rafael R. Vidal; *Sonido,* of an excellent lyric quality, by the rising Venezuelan poetess Isola Gómez. Jorge Carrera Andrade, perhaps the best living Ecuadorian poet, published *Microgramas,* synthetic poems of Japanese formula and *País secreto* of a profound melancholy. Antonio Massís, a Chilean poet of Arabian parentage, published a very original book of verses *Litoral celeste.* Luis Merino Reyes' *Latitud* is a blend of classic and modern feeling. The Argentinean Fernández Moreno wrote in *Continuación* a book of poetry in minor tone and excellent quality. Silvina Ocampo in *Viaje olvidado* shows promise. Good poetry is also to be found in *El alma lejana* by Edmundo Bianchi and *Mares ultrajados* by Ernesto Pinto of Uruguay.

Of the group of social-minded Spanish-American poets the following productions were important: *La sangre y sus estatuas* by the Chilean Andrés Sabella, *Poemas de una sola angustia* by the Dominican Hector Inchaustegui Cabral and *Trinchera* by the Cuban G. González Contreras. Arturo Torres Ríoseco wrote a *Canto a España viva* in which the poetical and philosophical values rise together to a high mark.

An interesting item was the book *Poesía indígena,* a translation of Náhuatl poems by Angel Mª Garibay.

The outstanding theatrical productions of the year were the historical drama *Rueda de Fuego* by Roberto Levillier and two comedies by Samuel Eichelbaum, *Un guapo del 900* and *Pájaro de barro.* (L. Mo.)

Spanish Colonial Empire. Total area (approx.) 322,300 sq.mi.; total population (est. Dec. 31, 1937) 26,055,000.

The table below lists the colonies, protectorates, etc., of Spain, together with certain essential statistics appropriate to each of them, including the mother country itself.

Spanish Colonial Empire

Country and Area sq.mi. (approx.)	Population Estimated Dec. 31, 1937 (000's omitted)	Capital, Status, etc.	Principal Products (in metric tons)	Imports and Exports (in thousand pesetas)	Road, Rail and Shipping	Revenue and Expenditure (in thousand pesetas)
Spain, including Canary Is., and Balearic Is., 194,200	25,050	Madrid, republic, *Caudillo:* General Francisco Franco Behamonde				
AFRICA Ceuta and Melilla, 77	115	—, administered as part of Spain	exports (1934) raw materials 899,553, manufactures 12,892	(1934) imp. 47,546 exp. 14,500		
Morocco, Spanish, 8,080	750	Tetuan, protectorate *High Commissioner:* General Carlos Asensio	(1936) iron ore (metal content) 579,000; (1934) antimony ore (metal content) 314	(1936) imp. 60,600 exp. 26,700	rds. *c.* 500 mi. rly. 80 mi.	(1936) rev. and exp. 50,271
Spanish Guinea, including Fernando Po, Rio Muni and four small islands, 10,380	120	Santa Isabel, colony	(1934–35) cocoa 14,900 coffee	(1930) imp. 17,625 exp. 21,970		(1932) rev. and exp. 11,020
Western Sahara, including Ifni, Rio de Oro, and Spanish Sahara, 109,600	20	Villa Cisneros, colonies	fish and dates			(1929) rev. and exp. 6,947

Spanish Guinea: *see* SPANISH COLONIAL EMPIRE.
Spanish Morocco: *see* SPANISH COLONIAL EMPIRE.
Spanish West Africa: *see* SPANISH COLONIAL EMPIRE.

Spelman Fund of New York was chartered in 1928. The fund, during 1940, continued its program directed at the improvement of the methods and techniques in the field of public administration. During the year, the fund appropriated $431,000.

The chairman of the board of trustees is Charles E. Merriam; the executive and secretary, Guy Moffett. (G. Mt.)

Spens Report: *see* EDUCATION, VOCATIONAL: *Great Britain.*

Spices. Between Oct. 1939 and the belligerency of Italy and the fall of France, the spice business went along

about as usual. Subsequent developments resulted in cessation of trading in Hungarian seeds and paprika, Balkan herbs and discontinuance of Turkish imports. France was an important source of supply and its large herb and celery seed business came to an abrupt halt. The French colonies saw their trade decrease sharply. The Mediterranean basin with its valuable spices was in 1940 tightly sealed, except for the few items native to the Iberian peninsula. Because a heavy tonnage of paprika had early been rushed to the U.S., practically the only market for it, there was little change in the price of paprika, but replenishment was uncertain. When 1940 opened, speculative stocks of black pepper in the U.S. approximated 51,700 tons—the requirements for about 3½ years. Imports fell off because of heavy 1939 shipments.

Wars usually cause high prices, but Netherlands Indian mace, nutmegs and cloves declined. The explanation is that countries blockaded in the war formerly bought these goods. There were heavier offerings to the U.S. Ginger crops in Sierra Leone and Jamaica were good and supplies were obtainable at less than customary figures. The largest producers of cloves are Zanzibar and Madagascar. In both places the business was government controlled. Higher priced cloves were expected. England and Europe formerly supplied most of the U.S. needs for mustard seed. England in 1940 put its acres into cereals; Europe had no access to America. Consequently, the farmers of California, Oregon, Washington and Montana planted more mustard seed than usual, but conditions in 1940 proved unfavourable. In some sections only 20% of a normal yield was harvested. Montana gathered about 55% of normal tonnage. The crops brought good prices. Interest in the crop increased. Acreage for 1941 may be the largest on record. The temporary passing of Holland was the more regretted because it produces very fine caraway and poppy seeds. These soon may disappear from the U.S. market.

For some years red peppers have engaged the attention of southern U.S. farmers. Disaster destroyed the 1940 harvests in Louisiana and Mississippi. Some growers delivered only 10% on tonnage contracts, with the result that there was an increased use of Oriental red peppers. Crops of fiery African red peppers were good, but expensive transportation made them costly.

Saigon cinnamon may become scarce because French Indo-China, its habitat, is a war area. Such Chinese cinnamons as canton rolls, mat cassia, taiwo, cassia buds and kwangsi were in uncertain supply through Hongkong. China, however, maintained the flow of cinnamons from the mainland to Hongkong, thence to the world.

Excepting for spices originating in lands affected by war, price changes were few. The use of spices in the U.S.A. grows as the public becomes better informed. Research disclosed that red peppers are a bountiful source of vitamin C. As 1940 closed, markets were stronger on news of British ships being transferred from the U.S.-East Indian-African routes to North Atlantic service. Scarcity of cargo space impended. (C. A. T.)

Spirits: *see* LIQUORS, ALCOHOLIC.

Sports and Games: *see* AIR RACES; ANGLING; ARCHERY; AUTOMOBILE RACING; BADMINTON; BASEBALL; BASKETBALL; BILLIARDS; BOWLING; BOXING; CHESS; CRICKET; CURLING; CYCLING; FENCING; FOOTBALL; GLIDING; GOLF; HANDBALL; HORSE RACING; ICE HOCKEY; ICE SKATING; LACROSSE; MOTORBOAT RACING; POLO; ROWING; SHOWS; SOCCER; SOFTBALL; SQUASH RACQUETS; SWIMMING; TABLE TENNIS; TENNIS; TRACK AND FIELD SPORTS; TRAP-SHOOTING; WRESTLING; YACHTING.

Squash Racquets. The veteran player Donald Strachan, of Philadelphia, Pa., did not contest his national title in 1940 and his place was occupied by another skilful Philadelphian, A. Willing Patterson.

The contest for the national doubles championship was a particularly keen one, with the winning team of Hunter H. Lott and William S. Slack, of Philadelphia, retaining their title for the third consecutive year. Another repeater was registered in the play for the national amateur team title, which went to Boston, Mass. Among collegians, the best in this field was Kim Canavarro, of Harvard, winner of the national collegiate title. The University club's fifth annual invitation intercollegiate squash racquets tournament was won by Charles Brinton, Princeton senior.

The 1940 crown in the competition for the national professional title was won by Alfred Ramsey, of Cleveland, O., who at 38 years of age beat his opponent who was 12 years younger (Eddie Schaeffer, of Pittsburgh, Pa.) in 20 minutes of play. Lester Cummings, the 1939 titleholder, did not compete because of the death of his father, but he won the metropolitan professional crown for the second time in a row. This victory gave Cummings a second leg on the George E. Ruppert Challenge trophy, three of which are necessary to retire it from competition. Miss Cecile Bowes won the women's national singles title, taking the place of Miss Anne Page who wore the crown for three years. A strong duo came to the fore in winning the women's national doubles for the second year, Mrs. John E. Bierwirth and Mrs. William H. Adams. Mrs. Ary J. Lamme won the women's metropolitan title. (J. B. P.)

Squires, Sir Richard Anderson (1880–1940), ex-prime minister of Newfoundland, was born at Harbour Grace, Jan. 18. He was educated at the Methodist college and Dalhousie university. He was called to the bar in 1911 while a member of the Newfoundland legislature. He was minister of justice and attorney-general, 1914–17, and colonial secretary 1917–18. and became leader of the Liberal party in 1919. He was prime minister, 1919–23, and again, 1928–32. He died in St. John's, March 26.

Stalin, Joseph Vissarionovich (1879–), Russian statesman and general secretary of the communist party of the U.S.S.R., was born in Georgia and succeeded Lenin as virtual dictator of the soviet union in 1924 (see *Encyclopædia Britannica,* vol. 21, p. 301).

Stalin, as usual, made few public appearances or statements during 1940. His mouthpiece for foreign affairs was Molotov (*q.v.*); for internal affairs, his various other commissars and the press. Successful conclusion of the Finnish war and annexation of the three small Baltic states and Bessarabia and northern Bukovina were the notable fruits of his foreign policy during the year. Stalin held a personal interview with Sir Stafford Cripps, the British ambassador, on July 1, but the results of British attempts to woo Russia away from the axis were not immediately apparent. (*See* also UNION OF SOVIET SOCIALIST REPUBLICS.)

Stamp Collecting: *see* PHILATELY.

Standards, National Bureau of. One of the most difficult problems confronting the National Bureau of Standards is to anticipate and, if possible, to keep a little ahead of the requirements of industry for new and more precise standards. An important step in this direction was taken during 1940. The new high voltage and X-ray laboratory building was completed and turned over to the bureau by the contractor in April. The equipment installed will permit measurements at the highest potentials used in elec-

trical and X-ray work. The larger part of the building is a single room, 136 ft. long, 65 ft. wide and 60 ft. high, so constructed as to form a complete metallic enclosure, or Faraday cage, which gives definite electrical conditions and prevents a high voltage discharge from interfering with other electrical measurements at the bureau. The X-ray equipment includes a 1,400,000-volt direct current generator capable of delivering an X-ray excitation current of 25 milliamperes. This is the most powerful generator thus far built and will supply two X-ray tubes, one of which is for standardization of dosage meters and the second for exploratory work in co-operative studies with the National Cancer institute.

The bureau's low-temperature laboratory has been rebuilt to give needed laboratory floor space, and the capacity of the liquid-air plant has been doubled.

The standard frequency radio broadcasting service was modernized and improved. Announcements are made by voice only and are given every five instead of every ten minutes. The duration of these announcements and of the intervals between them are so accurate that they themselves can be used as interval signals. The maximum deviation of any one of the oscillators from the mean value of the seven which constitute the national standard is only three parts in 100,000,000.

Many studies have been made of methods for extinguishing fires. A series of tests was conducted with carbon dioxide for fighting fires in buildings. The gas displaces the air required for combustion and thus smothers the flames with no water damage. It should prove a valuable adjunct to fire-fighting methods, particularly in buildings in which valuable records are stored. In co-operation with the Civil Aeronautics authority, tests are in progress to determine the best method of extinguishing fires in the engine compartments of aeroplanes in flight. Special testing equipment, including an engine nacelle built in front of the bureau's large wind tunnel which is used to blow an air stream over the engine, was provided for this work. Carbon dioxide and carbon tetrachloride systems have been tried with success.

A practicable method for the commercial production of ribose, a rare sugar of potential biological importance, has been developed at the bureau.

Considerable attention has been devoted to the new synthetic materials, and a circular on synthetic rubber was published in July. This meets an urgent need, and the first edition of the circular was quickly exhausted. As a part of the work on synthetics, studies have been made of the permeability of these materials to hydrogen and they have been found to possess advantages over natural rubber for balloons and airships. It also appears probable that such materials as nylon and vinyon may be used advantageously to replace natural textile fibres under some conditions. A co-operative project supported by the textile foundation is concerned with scientific and economic research for the benefit and development of the textile industry. This program is well under way and several fundamental papers have been published in the bureau's *Journal of Research*.

The co-operative research project, supported by the American Silver Producers, on new industrial uses for silver was brought to a successful conclusion. Interested industries have been given the results of this work and are proceeding with the development of commercial processes for lining containers, silver plating of electric contacts and the production of new industrial alloys containing silver.

The testing of materials and types of construction suitable for low-cost houses was continued, and 60 reports in the building materials and structures series have been issued. Special interest has been shown in the reports on typical wood frame construction, floor coverings, insulation and roofing materials. A third survey of roofs in service, covering the north central states, was conducted during the latter half of the year.

A report issued by the National Advisory Committee for Aeronautics deals with the bureau's work on light metal structural alloys in thin-sheet form. It is the most comprehensive report available on the subject and is particularly important in the designing of modern aeroplanes, railroad cars, etc., where strength depends upon a thin skin covering a large area.

In the field of commercial standardization the bureau has continued its endeavours to reduce waste through the elimination of needless varieties of sizes and styles of commodities. In particular, the simplification of containers for food products has received attention. New commercial standards are being developed through the co-operation of manufacturers, distributors and consumers; important ones published during the year cover domestic oil burners and after-market lights and signalling equipment for automobiles.

The bureau has continued its co-operation with purchasing agents of states, counties and cities in promoting the buying of supplies on the basis of specifications. It is also working with the American Standards association in the development of safety codes, a special accomplishment in 1940 being the issuance of several parts of the revised edition of the National Electrical Safety code.

The part played by the bureau during the war of 1914–18 is well known. Its work on optical glass, aeroplane engines, instruments and materials, and in the testing of supplies bought by the government, is a matter of history. In connection with the preparedness program, the bureau was again called upon for advice on military problems, including the properties of materials, the quality of supplies and the performance of instruments and equipment.

In the light of developments during the latter part of 1940, it was fortunate that an important step toward increased efficiency in procurement had been taken late in 1939. This was the creation of an Interdepartmental Screw Thread committee to take over and continue the work formerly carried on by the National Screw Thread commission. This committee was organized by the departments of war, navy, and commerce and has already issued a comprehensive report giving the standard screw threads and tolerances for government work.

The annual conference of State Utilities Commission of Engineers and the 30th National Conference on Weights and Measures, which were held at the bureau, were unusually successful. The attendance at the former conference was the highest on record and the latter was well above the average. Subjects of special interest discussed by the weights and measures group included the metering of bottled gases, the sale of packaged commodities and the best methods for instructing inspectors and for interesting the public in weights and measures matters. Members of the bureau's staff took a leading part in the symposium of thermometry organized by the American Institute of Physics and in the American Scientific congress held in Washington in May 1940.

The staff of the bureau on June 30, 1940 numbered 982 employees and 82 research associates. The regular appropriation for the fiscal year 1940 was $2,266,000, which included $100,000 for the purchase of additional land to round out the bureau's site and $198,000 for the special investigation of building materials and structures suitable for low-cost housing. In addition, deficiency items totalling $79,000 were provided. The results of the year's work were made available through 276 printed publications and articles. Forty-four mimeographed letter circulars were prepared and distributed on specific request. (L. J. Br.)

Stanford University (Leland Stanford Junior university). In the year 1940 construction neared completion on the new $600,000 building to house the Hoover Library on War, Revolution and Peace, so that its formal dedication in June 1941 will be one of Stanford's major semicentennial events. The David L. Farnsworth fund for general medical research work was established through a bequest of $900,000 by Mrs. Lotta P. Rossier.

The president of the university appointed a Stanford National Emergency committee to take inventory of the university's personnel and research facilities. For the students a civilian pilot training course was inaugurated under the Civil Aeronautics authority and given jointly by the university, which handles the ground school work, and by the Palo Alto airport, which offers flight instruction in radio-equipped training planes.

Work on the Klystron was continued, particularly in the application of the Klystron's ultra-short radio waves for possible military use; and its special use for the blind landing of aircraft was carried forward by the Sperry Gyroscope company, the university's licensee. Notable too in the research field was the construction in the physics laboratory of a cyclotron to conduct investigations of the technological qualities of steel.

Beginning with the autumn quarter the tuition fee for all students was raised $15 per quarter. In spite of this and the initiation of the national defence program, there was no decrease in the total registration of students. The faculty in 1940 numbered 595; the students, 4,349, of whom 1,355 were women and 1,140 were graduates. (R. L. W.)

Stark, Harold Raynsford (1880–), U.S. naval officer, was born at Wilkes-Barre, Pa., on Nov. 12. Graduated from the U.S. Naval academy in 1903, he was commissioned ensign two years later and served on various ships and at various naval stations from 1903 to 1917. During the World War of 1914–18 he was on the staff of Admiral William S. Sims, commander of the U.S. naval forces in European waters. He was chief of the naval bureau of ordnance from 1934 to 1937. On March 15, 1939 he was appointed chief of naval operations with the rank of admiral.

Admiral Stark was persistent throughout 1939 and 1940 in his pleas for a larger U.S. fleet and appeared a number of times before the congressional naval committees to urge larger appropriations. Upon his recommendation the house committee reported out the $4,000,000,000 bill for a two-ocean navy June 18, and scarcely more than a month later the bill was signed by President Roosevelt. On Sept. 3 Stark certified that the 50 destroyers

traded to Britain for naval and air bases in the western hemisphere were not essential to U.S. national defence.

Stars: *see* ASTRONOMY.
Steamships: *see* SHIPBUILDING.
Steel: *see* IRON AND STEEL.

Stettinius, Edward R., Jr. (1900–), U.S. industrialist, born Oct. 22 at Chicago, Ill., and educated at the University of Virginia, where he was a student from 1919 to 1924. The son of a wealthy father, he went to work in 1924 as a common labourer with General Motors corporation. Within six years he was assistant to the president and in 1931 vice-president.

In 1936 the U.S. Steel corporation made him chairman of its finance committee, an important office theretofore reserved ordinarily for men with long years of experience as business executives. In April 1938 he was named chairman of the board of "big steel." Meanwhile he had served as liaison officer between the NRA and the Industrial Advisory board. In the fall of 1939 he was named director of the short-lived War Resources board, an agency appointed to formulate industrial mobilization in case of war. On May 28, 1940 President Roosevelt made him commissioner of industrial materials for the Council of National Defence—a full-time job.

In the "super-defence" Office of Production Management, created Jan. 7, 1941, Stettinius became director of the important priorities division.

Stewart, George Craig (1879–1940), U.S. Protestant Episcopal bishop of Chicago, was born in Saginaw, Mich., August 18. He graduated from Northwestern university in 1902 and from the Western Theological Seminary, Chicago, in 1903. He was ordained as a Methodist, but in 1903 became an Episcopalian.

In Feb. 1930 he was elected coadjutor bishop of Chicago and was named bishop in November of that year. Bishop Stewart was noted as one of the leading preachers in the United States. He died in Chicago, May 2.

Stimson, Henry Lewis (1867–), U.S. statesman, of whom a biographical sketch appears in *Encyclopædia Britannica*, vol. 21, p. 410. A republican, he became an ardent admirer of Cordell Hull's policies as secretary of state (the office Stimson had held in Pres. Hoover's cabinet) and was always quick to defend Hull's actions against criticism. He favoured in particular a strong stand for the United States against Japan, Germany and Italy. Pres. Roosevelt appointed him secretary of war on June 20, 1940, the day Harry H. Woodring resigned the office. Confirmed by the senate, 56 to 28 on July 9, Stimson made several inspection tours of U.S. defences and consistently advocated speed-ups in the race against time for preparedness. On Dec. 13 he attributed the delay in production of war materials to strikes in vital industries and to private competition with the government for supplies and machinery. A week later he was appointed one of the four members of Pres. Roosevelt's "super-defence council." The others were Secretary of the Navy Knox, Sidney Hillman and William S. Knudsen, chairman.

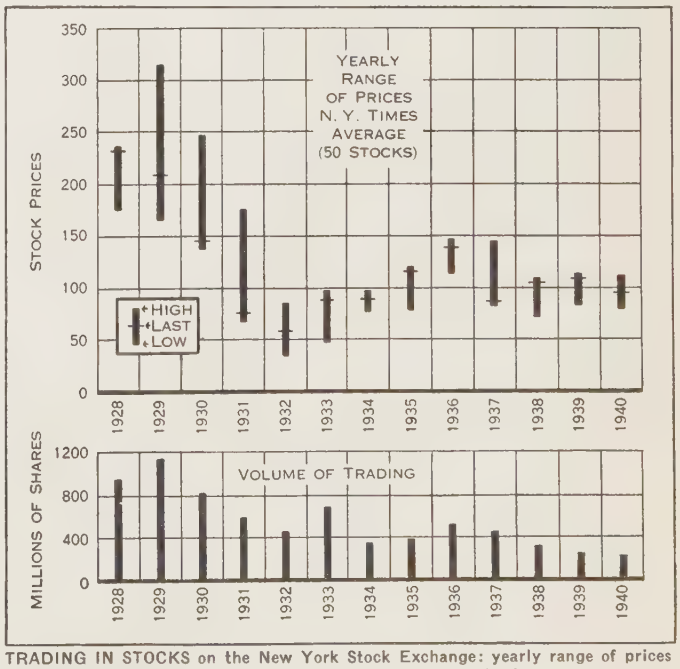
Stimson on Oct. 29 drew the first number in the U.S. draft lottery—158.

Stock Exchanges. The New York Stock Exchange during 1940 made a considerable number of important changes in its rules. The most significant of these actions may be grouped under five main headings:

Actions Designed for the Greater Protection of the Public.—Effective Feb. 1, the New York Stock Exchange announced a revision of its audit requirements whereby each member firm doing a business with the public shall select an independent public accountant to conduct an annual audit at a date selected by the accountant. According to the ruling, "the first indication a member firm is to receive that an audit is to be made of its affairs will be the appearance of the accountants at the office of the member firm." It was also announced, on Aug. 13, that "the minimum desirable scope of the blanket bond insurance of member firms doing business with the public should include coverage, running to the firm itself, against loss of its own or customers' property regardless of legal liability, of loss through employees' dishonesty, through theft or disappearance whether or not negligence played a part, through fraudulent trading by employees, through forgery or through loss in transfer." A new type of bond developed by insurance underwriters was also submitted to members, which provides that "the insurance company would restore promptly to the firm, up to the limit specified in the bond, any money, securities or other property of the firm, or its customers, of which the firm may be deprived by any fraudulent or dishonest act of any of the firm's partners."

Changes in Listing Requirements.—On May 4 announcement was made by the committee on stock list that new preferred stocks would not be listed unless the stock provided at least the following minimum voting rights, namely, (1) the right of the stock, "voting as a class, to elect not less than two directors after default of the equivalent of six quarterly dividends," and (2) "the affirmative approval of at least two-thirds of the preferred stock, voting as a class, as a prerequisite to any charter or by-law amendment altering materially any existing provision of such preferred stock."

Changes with Respect to Current Business Practices.—Effective March 1, the board of governors of the New York Stock Exchange adopted the recommendations of the special committee on brokers' and exchange revenues, with respect to mandatory service charges for custodian services, collection of coupons, dividend claims, transfers, transcript statements and special services. Subsequently this action was amended so as to permit application



TRADING IN STOCKS on the New York Stock Exchange: yearly range of prices and number of shares sold, exclusive of odd-lot and stopped sales

of the custodian charge of $1 either monthly or quarterly, and to permit a waiver of the charge altogether if a purchase or sale had taken place in an account during the monthly or quarterly period. On March 27, however, the action was repealed, it being announced that 400 of the 518 firms favoured such repeal.

Various actions were taken by the New York Stock Exchange with respect to multiple exchange trading. On Feb. 14 a special committee reported in favour of the rigid enforcement of the exchange's constitutional provision prohibiting members of the exchange from dealing on another exchange in securities which are listed on the New York Stock Exchange, and this recommendation was approved by the board of governors on Feb. 28. Later, on April 12, Governor Lehman signed the Williamson bill, removing prohibition of a stock exchange from making rules preventing a member from trading with members of other exchanges, thus facilitating the New York Stock Exchange's enforcement of a rule against multiple trading privileges. On April 12 the board of governors ruled that, effective Sept. 1, "members and member firms may not act as dealers, odd-lot dealers or specialists on other exchanges in securities which are listed on the New York Stock Exchange, but may continue to accept orders from customers for execution on such other exchanges." It was reported that 25 firms were affected by the ruling. Subsequently, on Oct. 25, the Securities and Exchange commission requested the New York Exchange to rescind its ruling. Thereupon the exchange advised that it "would await the full SEC report of its investigation, in order to ascertain if any new facts had been developed, before reaching a final decision on the commission's request."

On March 13 the board of governors of the New York Exchange amended the rules defining a "registered representative" so as to include under that designation "individuals engaged in the solicitation of subscriptions to investment advisory or to investment management services furnished on a fee basis by their member firm employers."

Mention should also be made of the rulings of the SEC restricting the use of customers' securities as collateral, such rules to become effective Feb. 17, 1941. According to press accounts: "Brokers and dealers are prohibited from commingling the securities of different customers as collateral for loans without the customers' consent; from commingling customers' securities with their own securities under the same pledge; from pledging customers' securities for more than the amount the customers owe them." The new rules were designed to give customers added protection against loss in the event of brokerage failures.

Proposed Legislative Changes.—The Coudert-Mitchell bill, introduced in the New York legislature on Jan. 25, provided for (1) repeal of the double taxation on odd-lots, (2) repeal of the emergency tax provision in effect since 1932, and (3) the establishment of new rates of one cent for each share sold for less than $10, two cents on shares sold between $10 and $50, and three cents on shares sold for $50 or over. Hearings were held on this bill, and the president of the New York Exchange also advocated, before the New York State Budget hearing, a reduction in the stock transfer tax on the ground that "not only is our securities business being diverted to other states, but the state of New York is being deprived of revenue which it otherwise should receive were the transfer tax modified realistically." Following its passage, the Coudert-Mitchell bill, it should be stated, was vetoed by Governor Lehman.

Reports of Committees Making Recommendations with Respect to Special Studies.—Two such reports deserve special mention, namely:

(1) Report of the special committee of the New York Stock Exchange for the separation of brokerage from dealing and underwriting business. Firms dealing with the public and also doing business as an underwriter and dealer, it was recommended, should be permitted to incorporate separately their underwriting, dealing and trading business, the brokerage business to be transacted by the firm as a partnership. The recommendation was approved by the board of governors on March 27, and on April 3 the committee on member firms announced its readiness to receive applications from member firms desiring to form affiliated companies.

(2) Newspapers carried accounts of a plan "for the consolidation of the 'night branch' with the 'day branch' of the Stock Clearing corporation, and a complete overhauling of the corporation's operations." The consolidation, to be effective Feb. 1, 1941, was reported to be designed to bring about both substantial economy as well as clearing efficiency.

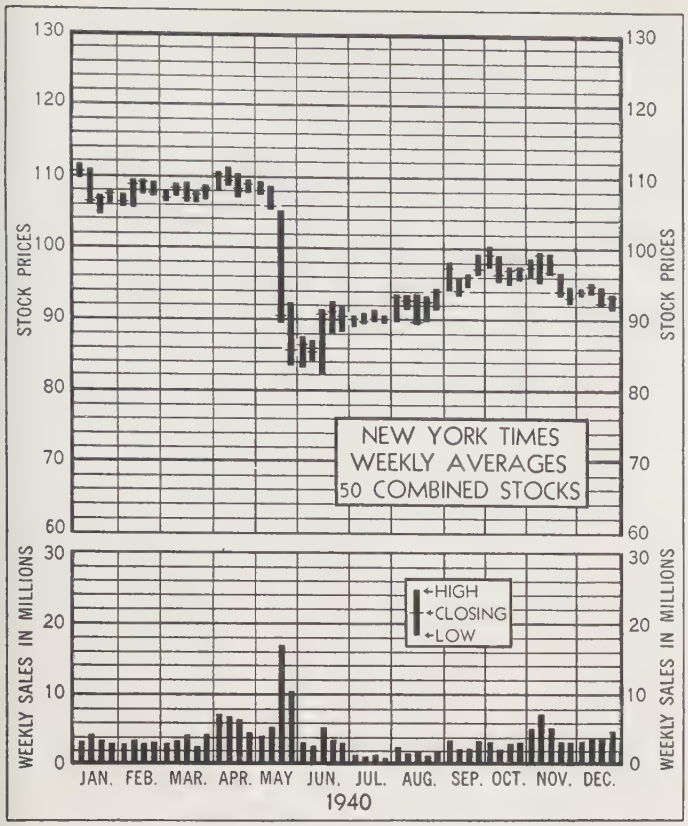
Stocks and Bonds.—The importance of the New York Stock Exchange as a major national market is shown by the huge volume of listings of securities. For stocks on Dec. 1, 1940, such listings aggregated 1,234 separate issues, totalling 1,457,085,000 shares, with a market value of $41,848,247,000. Listed bonds, on the same date, represented 1,307 issues, with a par value of $54,237,357,000 and a market value of $50,755,887,000. The number of issuing corporations or governmental units totalled 864 for stock issues and 613 for bonds. Roughly speaking, the New York Stock Exchange serves as the market place for approximately one-fourth of the total wealth of the United States. Of the aforementioned totals, foreign stock listings on December 1 aggregated only 40,484,000 shares, with a market value of $635,217,000, while private and public bonds of foreign nations stood at $4,360,474,000 par value, with a market value of $1,988,291,000.

Sales of stock on the New York Stock Exchange for 1940 totalled 207,605,359 shares, and for bonds, $1,671,598,875. For stocks the ratio of stock sales to listings amounted to 1·44% for the last month for which data were available. For bonds the ratio of sales to listings for the same month amounted to 2·93%. Volume of stock sales, it will be noticed, was, as in 1939, at a rather dull level during 1940, the stock total being 207,605,359 shares as compared with 262,015,799 shares for 1939, 297,000,000 for 1938, and 409,000,000 for 1937, and bond sales $1,671,598,875 as compared with $2,048,237,875 for 1939, $1,859,525,825 for 1938, and $2,790,323,300 for 1937.

Net borrowings of New York Stock Exchange members on collateral amounted to only 0·87% of the market value of listed shares on Dec. 1, 1940, whereas at the same date for 1939, 1938, 1937, 1930, 1929 and 1928, the ratios were, respectively, 1·26%, 1·35%, 1·69%, 4·06%, 6·32% and 9·66%.

With respect to the New York Curb Exchange, sales during 1940, as reported by the *New York Times,* totalled 43,041,774 shares as compared with 45,800,633 shares during 1939, 49,795,922 shares during 1938, 104,178,804 shares during 1937, and 134,843,049 shares during 1936. Bond sales totalled $304,605,000 during 1940 as compared with $446,059,000 during 1939, $367,937,000 during 1938, $442,993,000 for 1937 and $823,050,000 for 1936. (S. S. H.)

Stocks. Despite the sensational war news of the year, from both a national and international point of view, 1940 stock market movements were in no sense extraordinary. In fact, the market as a whole was surprisingly steady in view of the year's news. For nearly all groups of stocks the price level remained substantially the same from January to April 1940, and at a figure about the same as the monthly average for Dec. 1939. After April a moderate decline occurred, which spent its force by the close of June. Thereafter a rise ensued, month by month, to December, although the price level reached was considerably



below the Dec. 1939 level for all groups of stocks, with the exception of the railroad group. From the beginning of Dec. 1940 the price level remained substantially the same, with, however, a drooping tendency, particularly in the so-called war stocks.

Using the Standard Statistics company barometer figures (average for each month based on daily closing prices), the average monthly price of 20 representative railroad stocks stood at 31.2 for Jan. 1940, as compared with 31.7 for Dec. 1939. Thereafter a rather serious decline occurred which reached its culmination in June with a monthly average of 22.1, or a decline of approximately 29%. Thereafter a steady increase in the price level took place, month by month, until for November a monthly average of 31.1 was established. This average, it should be noted, was almost the same as that for Dec. 1939, namely, 31.7.

In the field of industrial stocks, using the Standard Statistics company average for 50 leading issues, the average monthly price stood at 119.0 for Jan. 1940, as compared with 120.2 for Dec. 1939. Thereafter the average declined to 93.0 for June 1940. After that month the average showed a consistent monthly increase until November (the last month available) when the average stood at 110.7. This November average, it should be noted, was considerably below the Dec. 1939 average of 120.2. Similar price movements occurred in other leading groups of stocks, like the public utility, and copper and brass groups. The public utility group showed a monthly average decline from 70.4 in January to 56.8 for June, and a subsequent rise to 58.9 for November. The copper and brass group declined between January and July from 134.8 to 92.3, with a subsequent rise to 114.6 for November. The November averages for these two groups, however (namely, 58.9 and 114.6), were still materially lower than the corresponding averages for Dec. 1939 of 68.5 and 141.3. Combining all of the afore-mentioned groups of stocks (90 shares), the market showed a decline from 97.7 in January to 76.8 in June and a subsequent rise to a monthly average of 90.2 for November. This November average of 90.2 can be compared with the Dec. 1939 average of 98.2.

At the close of Jan. 1940 the market value of all listed shares on the New York Stock Exchange stood at $45,636,656,000. At the close of June, the bottom of the year's decline, this market value stood at $38,775,241,000, a depreciation of 16%. On Dec. 1 the combined value had again risen to $41,848,247,000, whereas the year previous (Dec. 1, 1939) the figures were $45,505,229,000.

From the foregoing data it is clear that 1940 stock market movements were in no sense sensational, as might so well have been expected in a period of world conflagration. The decline during the first half of the year, with respect to each of the leading groups of stocks, was in substantial measure counterbalanced by the rise from July to November, latest figures, however, indicating that the price level was still considerably behind that established at the close of 1939. The whole showing is rather surprising in view of the substantial enlargement of business activity due to large war orders, and the initiation of a national defence program. Probably the absence of substantial market movements is attributable to the fact that fundamental conditions affecting business have not changed materially. The burden of taxation upon corporations, an unbalanced national budget and a burdensome and growing indebtedness seemed to indicate in 1940 every prospect for further extensions. Increased volume of business was counterbalanced with fears in the direction of possible price restrictions and general governmental regimentation of business. As previously explained, the stock market is a discounter of the future. The queer action of the market during the year probably represented a discounting of the future action of the government with respect to the afore-mentioned factors.

Evidently, stock-market-wise, war no longer affords the speculative community the glamour that was the case at the close of 1914 and the first half of 1915. In 1939 the most sensational increases were confined to industrials likely to profit from war orders. Thus Bethlehem Steel and United States Steel common at one time rose to $100 and $82, respectively, but closed the year with declines to $82 and $66. In 1940, although operations were at full capacity, the shares of these two major companies never reached a higher price level than $93 and $76.50, and on Dec. 22 the quotations were $85 and $68⅝.

Number, Volume and Amount of Stocks.—According to the New York Stock Exchange's compilation, the total of stocks listed on that exchange on Dec. 1, 1940, stood at 1,457,085,000 shares, with a market value of $41,848,247,000. This value compared with $45,505,229,000 and $46,081,000,000 at the corresponding dates of 1939 and 1938. Of 1940's total, United States stocks

Security Market Price

	Railroads 20 stocks		Industrials 50 stocks		Public Utilities 20 stocks		Copper and Brass 7 stocks		Stocks 90 stocks	
	1939	1940	1939	1940	1939	1940	1939	1940	1939	1940
Jan.	31.3	31.2	122.5	119.0	66.6	70.4	145.6	134.8	99.3	97.7
Feb.	30.3	30.9	120.7	118.3	69.7	69.9	134.6	131.7	98.5	98.0
March	31.1	31.4	120.4	119.1	69.6	67.6	136.9	138.0	98.3	97.3
April	25.6	31.2	105.2	119.0	62.1	68.7	115.6	137.2	86.0	97.4
May	26.8	26.4	108.7	102.4	65.5	60.4	114.0	117.6	89.2	84.0
June	27.2	22.1	110.7	93.0	66.6	56.8	117.9	99.3	90.8	76.8
July	27.9	26.3	113.2	95.1	68.6	61.7	123.1	92.3	93.0	79.4
August	27.0	26.9	111.1	97.5	70.2	61.1	125.1	97.8	91.6	81.0
Sept.	32.6	28.8	125.1	102.2	67.1	60.9	152.3	107.5	101.4	84.4
Oct.	35.0	29.4	125.5	103.5	69.0	59.8	154.2	113.2	102.4	85.2
Nov.	33.5	31.1	123.0	110.7	69.5	58.9	146.9	124.5	100.6	90.2
Dec.	31.7	28.4	120.2	103.0	68.5	53.8	141.3	125.7	98.2	83.7

The above figures are an average for the month based on daily closing prices, except for copper and brass, which are weekly prices. (Source of data—*Standard Trade and Securities, Statistical Bulletin—Standard & Poor's Corporation.*)

aggregated 1,416,601,000 shares, valued at $41,213,030,000, and foreign stocks 40,484,000 shares, valued at $635,217,000. The total of shares was distributed over 1,215 separate U.S. issues and 19 foreign issues, representing a total of 864 issuing corporations.

Total shares traded on the New York Stock Exchange during 1940 amounted to 207,605,359, as compared with 262,015,799 shares in 1939; 297,446,059 shares in 1938; 409,468,000 in 1937; and 1,124,991,000 in 1929, the largest total on record. From the standpoint of activity in sales, the 1940 market may be described as relatively stagnant and rarely did daily sales exceed the 2,000,000 share mark. The New York Curb Market had sales during 1940 of 43,041,774 shares. For other security exchanges of the country data were not available at the time of this compilation, but the other U.S. exchanges are relatively unimportant, as regards volume of transactions, in comparison with the New York Stock and the New York Curb Exchanges. (*See* also STOCK EXCHANGES: *Stocks and Bonds.*) (S. S. H.)

Stone. The form in which it is produced leads to two main classifications for stone: dimension stone and crushed or broken stone. Dimension stone is used in building construction, monuments and memorials, curbing, flagstones and paving stones. Crushed and broken stone are used mainly in concrete aggregate, road metal, railroad ballast and riprap, besides a number of other uses dependent on the specific character of the various kinds of stone, especially with limestone and sandstone. In general, only a little over 1% of the total output is dimension stone, although it represents probably one-sixth of the value.

The main varieties used include basalt, granite, limestone, marble and sandstone; among the minor varieties are mica schist, argillite, volcanic rocks, boulders and serpentine. Discussion of granite and marble will be found in the article MARBLE AND GRANITE.

Basalt.—Trap rock, or basalt, production in the United States in 1939 was only 101,300 short tons as dimension stone, but 15,990,000 tons as crushed stone, 86% of which was used as road metal or concrete aggregate, and 5% as railroad ballast. British production of basalt is not reported separately, but is included with other igneous rocks under MARBLE AND GRANITE.

Limestone.—The production of limestone as dimension stone in the United States in 1939 increased 50%, to 1,061,000 short tons, valued at $6,678,000, while crushed and broken stone increased by 23% to 90,785,000 tons, valued at $88,140,000. Of the dimension stone, 98% was for building stone, while 61% of the crushed stone was for concrete aggregate and road metal, 17% for metallurgical flux, 4% for railroad ballast and 5% for agriculture. These figures do not include some 30,000,000 tons used in cement and 8,500,000 tons used in lime, which would give a grand total of about 130,000,000 tons. Canadian limestone production decreased in 1939 by 25% to 4,150,000 short tons, valued at $3,818,000.

The production of limestone in Great Britain in 1938 decreased slightly to 18,830,000 long tons, valued at 4*s.* per ton; of this total, 40% was for road metal and ballast, 32% for lime and cement, 12% for metallurgical flux, 5% for the chemical industries and 4% for concrete aggregate.

Sandstone.—The production of sandstone as a dimension stone is comparatively small in the United States, the 1939 output being 195,600 short tons, valued at $1,956,200, an increase of 18% over 1938; 41% of this was used in paving, curbing and flagging, and the remainder as building stone.

Sales of crushed and broken sandstone were 8,658,000 short tons, valued at $9,789,000, a rise of 41% over 1937; of the total, 65% was used for concrete aggregate or road metal, 7% as a refractory, 3% as railroad ballast and 4% as riprap. The production of sandstone in Canada increased 74% in 1939, to 176,300 short tons, valued at $311,800.

Sandstone production in Great Britain in 1938 increased by 1% to 4,947,000 long tons, valued at 7*s.* 10*d.* per ton; of the total, 56% was used as road metal or ballast, 15% as a refractory, 14% for concrete and 11% as building stone. (G. A. Ro.)

Stones, Sharpening: *see* EMERY.

Straits Settlements is one of the three larger subdivisions of British Malaya, the others being the Federated and Unfederated Malay States (*qq.v.*). It is administered by a governor with an advisory council (governor, Sir Thomas Shenton Whitelegge Thomas). The area is 1,356 sq.mi.; the population, according to an estimate of 1939, was 1,372,362, divided, according to race, as follows: Chinese, 877,348; Malays, 306,382; Indians, 149,284; Europeans, 14,189; Eurasians, 12,953; others, 12,206. The Straits Settlements includes the two chief ports of Malaya: Singapore and Penang. Its administrative subdivisions are: Singapore island, Penang island, Province Wellesley, Malacca, Pangkor, Christmas island, Labuan and the Cocos islands. The 1940 revenue was £4,375,482; the expenditure was £5,273,367. The public debt amounts to 30,000,000 Straits dollars. There are 1,007 mi. of metalled roads and 3,612 mi. of telegraph and telephone lines. There are wireless stations in Singapore and in Province Wellesley, serving Penang.

The principal exports in 1938 were rubber, tin, motor spirit, copra and rice. The unit of currency is the Straits dollar (47.51 cents U.S. in Dec. 1940). (W. H. CH.)

Strategic Mineral Supplies. While the armed conflict of 1940 was confined to rather restricted areas in Europe, Asia and Africa, the entire colonial empires of Britain, France, Belgium, the Netherlands, Italy and Japan were almost as much involved as were the mother countries. Furthermore, among the nominally neutral countries, few were in reality neutral, for nearly all were so closely linked with one or more of the belligerents, either geographically, economically or politically, that their neutrality was a very lopsided affair. With the whole world engaged in conflict, active, prospective or potential, the subject of strategic mineral supplies received primary consideration by all concerned, especially since so many important producing areas were embraced by the zones of conflict.

It is now pretty well recognized that the only safe solution of the problem is the creation and maintenance of emergency stocks of these materials sufficient in amount to cover any prospective shortage if and when outside sources of supply are no longer accessible. France started on a program of stocking manganese ore as early as 1923 and there was evidence of similar moves in other countries later, especially Germany and Italy, and it is understood that Great Britain also did considerable stocking when she finally woke up to the fact that war was inevitable. The full extent to which the stocking program was carried, the countries involved and the materials stocked, could not (Jan. 1, 1941) be determined and might never become known, but it was certain that stocking was done to a sufficient extent to alter in a very material degree the abilities of the various countries participating in the war to meet their emergency demands. In fact, it is quite likely that without stocking in advance, the war would have been brought to an entirely different status and might even have been ended. For example, it would hardly need much in the way of argument to convince even the most casual observer that Germany would not have been able

to maintain her air force and mechanized units on the scale that was evident if she had available only current supplies of petroleum and the domestic output of motor fuel from by-product sources, without an extensive accumulation of stocks in advance. In fact, the main questions asked in 1940 were whether these stocks were exhausted and, if not, how much longer they would be likely to last. The same was true of other materials.

In the United States the accumulation of emergency stocks has been advocated since about 1925, but it was not until June 1939 that such a program was officially recognized and authorized. Even then, the enabling act to supply the necessary funds was limited to such a small amount and so much time was lost in fixing specifications that the outbreak of war in Europe came before much progress had been made, resulting in still further delay and disorganization of the program because of the disturbed condition of the market.

At the end of the fiscal year, June 30, 1940, the results of the first year of operation were reported, but were relatively so small as to be of little significance. Later in the year, the original program was supplemented by purchases made by the Metals Reserve company, an agency of the Reconstruction Finance corporation, and by the end of the calendar year considerable progress had been made, although no statement was forthcoming of the total orders placed or the amounts of the various commodities actually delivered.

Aside from the purely domestic features that were an integral part of the United States defence program, the most interesting feature of the strategic minerals situation was the extent to which the progress of the war altered the status of Germany through the acquisition of needed sources of mineral supplies in the countries conquered and occupied.

In the past, Germany's greatest deficiency had been in iron ore; two-thirds of the supply was imported and, since the imported ores were of better grade than those of domestic origin, the actual equivalent was probably nearer three-quarters. The areas under military occupation in 1940 reduced this shortage to a sufficient degree that the remaining amounts could be secured from Sweden, where the economic domination was almost as strong as was the military domination in the occupied areas.

With copper, lead and zinc, extensive smelting capacity was acquired in the occupied countries, but there was little mine output, the smelters having been operated with imported ores. This being the case, little relief was gained except for such stocks of metals and ores as the plants happened to have on hand at the time of capture. The only exception to this was the zinc ore output of Poland, where ore production was about 60% of smelting capacity. Aside from these minor ore supplies, Germany lacked access to outside sources of ore to maintain operation of the plants.

The bauxite deposits and aluminium smelting plants of France lie outside the occupied area, but if these materials were seriously needed in Germany, doubtless pressure would be put on the Vichy government to make them available, regardless of any domestic requirements. Between this and the economic tributaries of Hungary and Yugoslavia, both ore supply and smelting capacity could be maintained.

By a successful application of the principles of blitzkrieg, Germany succeeded in wiping out some of the most serious of her original handicap in the way of metal supplies, but others remained. Of these, probably manganese and nickel were the worst. The Norwegian nickel supplies could not more than partly fill the German needs, and aside from advance stocks, the only available source of manganese was, in 1940, the soviet union, with deposits far removed from the German border and transportation facilities limited. On the other side of the struggle, Great Britain was handicapped by the loss of smelting sources in France, Belgium and the Netherlands, but still had access to adequate ore supplies if it could supply the necessary bottoms and get them through the German blockade. Nevertheless, in spite of these and other losses, the shift from offensive to defensive warfare probably strengthened the British position more in a relative degree than conquest strengthened the German position.

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(G. A. Ro.)

Strategy of the European War. Perhaps the greatest strategical lesson of the European war up to Jan. 1, 1941 was the necessity for closer relationship between strategy and policy; a necessity arising from the far greater dependence than ever before of fighting forces upon industrial support on the one hand, and upon the increased speed of movement of fighting forces on the other, which deprived unprepared nations of the power of recovering from the initial blows of an enemy and thus compelled the makers of policy to take greater account of military considerations. The historic "muddle" period which distinguished not only British but other nations' approach to war was sharply reduced; there was in 1940 no time for muddling.

Thus was emphasized the need for better instrumentalities for creating and effectuating a sound military policy, and for relating it to the other departments of state policy; especially in democratic states, since such instruments existed already in totalitarian states and were indeed inherent in the nature thereof. Von der Goltz's maxim that each state must have a national strategy could not be more strongly underlined than by the events of the European war; but to have such a strategy it is not enough that soldiers and sailors and airmen should make plans within their specialized fields, or that plans for utilizing the industrial resources of the nation should be laid out on paper. There must be a complete correlation of policy with strategy; of the political ends to be sought with the military means available to achieve them. Such correlation must be flexible; adaptable to changing conditions and changing needs. Obviously, therefore, the machinery for achieving it must be a permanent part of

MOMENTOUS MEETING of Hitler and Mussolini at Brennero, Italy, on March 18, 1940, preceding the Nazi invasions of Norway, the Low Countries and France

the governmental structure; and since the responsibility for the making of such plans cannot be divorced from the responsibility for their execution, it is clear that such machinery must include, in its directing body, the highest executive officials of the state as well as its chief military and naval authorities. It is only thus that the resources available may be used to the best advantage, and that the foreign relations of the state may have that support which is essential to their successful conduct in a world where, unhappily, force remains the fundamental element in international relations.

If not so supported by a continuous and authoritative policy-making body, strategy is hampered and perhaps fatally weakened at the moment when it comes into play. If the uses to be made of the armed forces have not been thought through, they will be deficient in equipment, organization and training for the employments which war may require of them. Thus the national strategy of France hinged upon the Maginot line as a protection against German invasion; yet the Maginot line was not extended along the Belgian frontier, thus resting the security of France upon Belgian ability to resist a German onset, while relations with Belgium were permitted to deteriorate to a point where such resistance could not be depended upon. Obviously either there should have been the closest and most thorough Franco-Belgian military co-ordination; or a French defence system which took no account of Belgium as a potential ally; or, if this were too expensive, then the whole Maginot conception was wrong and the money expended on forts should have been put into improving and increasing the field army, which is not fixed in position and could meet an enemy thrust wherever it came.

Strategy of "Blitzkrieg."—The so-called German *Blitzkrieg* represents nothing new in strategical conception. Its chief reliance is on speed, which has been called "the hand-maiden of surprise"; and speed and surprise produce in turn those physical and psychological dislocations which have ever been the chief aims of master strategists. The best strategy is of little effect unless there exists the tactical means for exploiting its dispositions; a feature of German *Blitzkrieg* strategy is its boldness, which in turn means its complete confidence in its tactical means to carry out any mission assigned to it. These tactics are still based on the historic tactical twins, fire and movement, with the intervention of the aeroplane as a member of the battle-team, providing as it does the increased mobility on the battlefield of which the machine gun had for a little time tended to deprive the ground forces, and supplemented by the use of armoured troops on a scale hitherto unheard of.

In general, German tactics seek to follow the principles of von Schlieffen and von Moltke—envelop, surround, destroy. To "horizontal envelopment" by outflanking movements has been added "vertical envelopment" by air forces (hitherto this was only possible to a limited extent by artillery fire); and attacks from the rear have been made both more feasible and more dislocative in their effects by the speed and fire-power of mechanized troops. In the Polish campaign the essential aim of the German strategy was to envelop the Polish armies in a double pincer movement; the northern pincers closed on the corridor, the southern on Silesia; the two then combined in a grand pincer movement directed upon the main Polish forces and on Warsaw. The supply and reinforcement of the Polish armies and the completion of their mobilization became impossible from the first, due to the "vertical envelopment" strategy of the German air force. In the Norwegian campaign the envelopment of the Norwegian army and people was accomplished by the immediate seizure of the main seaports, which were also the main mobilization centres of that country. In the campaign against France and the Low Countries, the Dutch were enveloped by the use of parachutists and fifth columnists in Rotterdam and at key positions elsewhere in the country; the Allied armies of the northwest were enveloped by the armoured forces, supported by motorized forces, which broke through on the Meuse and raced down the Somme to the Channel coast, while the German air force effectually hampered the manoeuvring power of the main French forces. In all these campaigns, speed and boldness were the characteristic elements of German strategy, which nevertheless was securely founded on the ancient precepts of concentration, offensive action and security.

Strategy of Air Power.—As most sober students of war had predicted, air power found its chief and most useful application in this war, its first great testing ground, when used in conjunction with surface forces for the achievement of well considered ends. It proved quite incapable, by itself, of gaining a major decision. It did not overwhelm Britain in a few days, nor did it even begin to weaken the morale of the British people. The use of air power by the Germans as a part of their military force in Poland and France was a notable example of planning and staff work, implemented by brilliance in execution.

Its effect was greatest where numbers of planes and pilots, short ranges and accumulations of material permitted a high degree of continuity of action, as in the short campaign against France. Both in France and Poland this effect was accentuated by the weakness of the defender's air forces. When the *luftwaffe* clashed with the qualitatively superior royal air force over Great Britain in August and September, it was defeated. Indeed, the effect of such qualitative superiority was shown to be a factor of much greater proportional importance than numerical superiority. Against effective opposition, the German air force was never able to obtain a sufficient degree of continuity of action, of steady application of force to a crucial point, to produce a decisive effect. This is inherent in the nature of the aeroplane itself, and of the uncertain and trackless element in which it operates.

One point little understood, but fundamental to air strategy, is the strategical immobility of air forces, illustrated again and again in this war, but notably in Norway and the Mediterranean. Lack of bases at first hampered German air operations in Norway, then acquisition of bases as against the British inability to do likewise permitted the Germans to gain the upper hand. In the Mediterranean the German air force was by Jan. 1, 1941 unable to intervene with any effect to save Italy from the blows of the British combined forces because it had no bases from which to operate either in Africa or the Aegean, and could not establish such bases by itself. Tactically the most mobile of all forms of armed power, within its radius of action from an established base, air power is strategically the most immobile because it cannot move its own base; this must be done for it by ships or on wheels. The larger and more complex the air instruments and weapons become, the more dependent air power is upon fully equipped and completely protected bases; the fate of the German dive-bomber squadrons in Sicily is suggestive of what may happen even to good squadrons when they have to depend on an ill-protected or improperly equipped base.

Naval Strategy.—The naval events of this war have served only to confirm the accepted underlying doctrine of naval strategy—that the object of all naval operations is the control of maritime communications, the preserving of them for one's own use, the denying of them to an enemy.

Unable to oppose the British at sea with surface forces, Germany has been compelled, in this war as in the last, to rely on the weapons of the *guerre de course,* the weapons of evasion, for her attacks on Britain's most vulnerable point: her sea-communications. Inability to maintain the sea-communications of

her overseas forces resulted in the collapse of Italy's African empire, where her isolated forces could not oppose the better supplied forces of Britain. Very probably the ability of Britain to continue to hold her grip on the Mediterranean, while keeping open the supply routes of the island of Great Britain herself, may prove the crucial test of this war.

Combined Strategy.—It is in the field, however, of the combination of strategical means—land, sea and air—that the military lessons of this war have been most significant. The German land-air combinations in Poland and France brought them victory; their land-sea-air effort in Norway was likewise successful, being countered by no comparable organization; but in the Mediterranean the British showed their ability to learn this lesson, and it seemed probable by Jan. 1, 1941 that their combined operations in the eastern Mediterranean would go down in military history as a classic example of their sort. The tendency is not toward a unified command of all forces: the French had this and failed; the British did not have it and were successful. It is rather in the field of combined planning, of close co-operation between the various types of forces, in adaptation to changing conditions and of mutual confidence born of association that the strategist of the future will find his greatest problems and reap his richest rewards. Air forces have become indispensable parts of land power as of sea power; there is also some, but so far a limited scope for independent air operations; even those taking place over Germany and Britain in 1940 were but parts and extensions of blockade and counterblockade, their object being to interrupt communications and interfere with the processes of armament, which was likewise the object of the blockading forces. In the better combination of military means for the achievement of military ends, and in the closer co-ordination of strategy with policy for the achievement of national ends, lies the task of the soldier and the statesman of tomorrow's war. (*See* also AIR FORCES; ARMIES OF THE WORLD; EUROPEAN WAR; LIGHTNING WAR; MUNITIONS OF WAR; NAVIES OF THE WORLD; TACTICS IN THE EUROPEAN WAR.) (G. F. E.)

Streamline Trains: *see* RAILROADS.

Strikes and Lock-outs. The United States, Canada and Great Britain publish current statistics of strikes and lock-outs, their causes and results, together with detailed reports upon the more important strikes of each year. Most of the other nations report them less regularly; some not at all. The Canadian department of labour published a report on strikes throughout the world in the *Labour Gazette*, March 1937.

The political situation in Germany, Italy, Russia and Japan has made it "inadvisable" in recent years for wage earners to undertake strikes. The European war added Czechoslovakia, Poland, France, Norway, Denmark and the Low Countries, to the area in which strikes would be ruthlessly suppressed.

The year 1940 saw less strike activity in the United States than in 1939, but a definite increase in the number of strikes toward the end of the year. In the first ten months of 1939 there were 2,032 strikes started,

Table I.—*Number of Strikes, Workers Involved, and Man-Days Lost, 1933–October 1940**

Monthly Labor Review, United States Bureau of Labor Statistics

Year and month	Number of strikes					Workers involved in strikes		Man-days idle during month or year
	Continued from preceding month	Beginning in month or year indicated	In progress during month	Ended in month	In effect at end of month	Beginning in month or year	In progress during month	
1933	..	1,695	..	..	..	1,168,272	..	16,872,128
1934	..	1,856	..	..	..	1,466,695	..	19,591,949
1935	..	2,014	..	..	..	1,117,213	..	15,456,337
1936	..	2,172	..	..	..	788,648	..	13,901,956
1937	..	4,740	..	..	..	1,860,621	..	28,424,857
1938	..	2,772	..	..	..	688,376	..	9,148,273
1939	..	2,613	..	..	..	1,170,962	..	17,812,219
1940 (10 mos.)	..	2,089	..	..	..	426,519	..	5,130,381
1940								
January	94	178	116	118	92	25,156	39,503	239,170
February	92	179	148	136	104	28,421	36,787	282,445
March	104	196	150	160	94	21,736	42,125	376,753
April	94	226	198	184	108	36,603	49,880	429,866
May	108	221	197	219	86	49,930	73,966	648,147
June	86	203	168	158	96	34,673	51,949	459,000
July	96	188	200	181	115	52,000	66,000	485,000
August	115	235	225	205	135	52,000	73,000	615,000
September	112	228	340	205	135	63,000	95,000	732,000
October	135	235	370	225	145	63,000	95,000	865,000

*Strikes involving fewer than 6 workers or lasting less than 1 day are not included in this table nor in the following tables. Notices or leads regarding strikes are obtained by the Bureau from more than 650 daily papers, labour papers, and trade journals, as well as from all government labour boards. Letters are written to representatives of parties in the disputes asking for detailed and authentic information. Since answers to some of these letters have not yet been received, the figures given for the late months are not final. This is particularly true with regard to figures for the last 4 months, and these should be considered as preliminary estimates.

Table II.—*Major Issues Involved in Strikes in the United States beginning in January, March and June 1940*

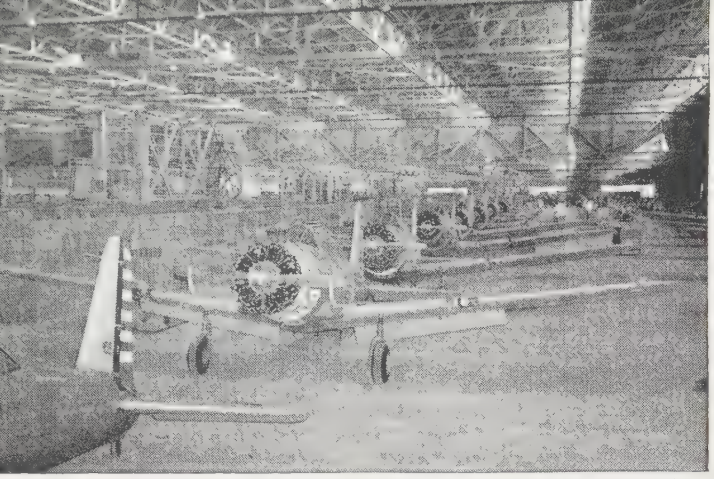
Major issue	January		March		June	
	Number	Percent	Number	Percent	Number	Percent
All issues	101	100.0	131	100.0	168	100.0
Wages and Hours	*33*	*32.7*	*38*	*29.0*	*69*	*41.1*
Wage increase	19	18.8	30	22.9	53	31.5
Wage decrease	5	5.0	6	4.6	4	2.4
Wage increase, hour decrease	7	6.9	2	1.5	7	4.2
Wage decrease, hour increase	1	1.0	..	..	..	..
Hour increase or	..	..	..	..	1	.6
Hour decrease	1	..	..	..	4	2.4
Union organization	*43*	*42.5*	*65*	*40.6*	*75*	*44.6*
Recognition	10	9.9	17	13.0	7	4.2
Recognition and wages.	13	12.8	20	15.2	16	9.5
Recognition, wages and hours	8	7.9	10	7.6	21	12.4
Closed or union shop	9	8.9	11	8.4	18	10.7
Discrimination	3	3.0	6	4.6	7	4.2
Other	..	..	1	.8	6	3.6
Miscellaneous	*25*	*24.8*	*28*	*21.4*	*24*	*14.3*
Sympathy	..	..	3	2.3	1	.6
Rival unions or factions	3	3.0	5	3.8	5	3.0
Jurisdiction	5*	5.0	..	..	2*	1.2
Other	17	16.8	20	15.3	16	9.5

Compiled from *The Monthly Labor Review*, U. S. Bureau of Labor Statistics.
*It is probable that the figure given does not include all jurisdictional disputes in the United States.

Table III.—*Labour Disputes in Great Britain, January to September 1940 and January to September 1939*

Industry Group	January to September 1939			January to September 1940		
	Number of Disputes Beginning in Period	Number of Work People Involved in All Disputes in Progress	Aggregate Duration in Working Days of All Disputes in Progress	Number of Disputes Beginning in Period	Number of Work People Involved in All Disputes in Progress	Aggregate Duration in Working Days of All Disputes in Progress
Fishing and agriculture	7	1,000	43,000	4	4,400	27,000
Coal mining	266	136,000	385,000	260	151,100	390,000
Other mining and quarrying	9	1,300	45,000	4	200	1,000
Brick, pottery, glass, chemicals, etc.	7	900	8,000	22	1,400	4,000
Engineering	50	27,700	154,000	47	14,600	57,000
Shipbuilding	31	3,900	34,000	41	5,900	23,000
Other metal	62	12,000	72,000	72	8,000	31,000
Textile	54	7,300.	102,000	44	8,600	75,000
Clothing	20	4,000	10,000	21	5,500	22,000
Food, drink and tobacco	9	1,000	10,000	11	4,900	13,000
Woodworking, furniture, etc.	17	2,600	23,000	7	400	1,000
Building, etc.	102	30,900	119,000	63	22,000	69,000
Transport	25	9,200	45,000	31	5,300	13,000
Commerce, distribution, finance	6	700	1,000	6	500	1,000
Others	22	2,200	13,000	32	6,800	16,000
Total	687	240,700	1,064,000	665	239,600	743,000

Compiled from *The Ministry of Labour Gazette.*



MOST PUBLICIZED STRIKE of 1940 was that of United Automobile Workers in the plant of Vultee Aircraft Inc. at Downey, Calif., where work on military aircraft was stopped. The strike was settled Nov. 26 after 12 days

in 1940 but 1,872; in 1939 there was a loss of 14,516,127 man-days, in 1940 only 6,894,976. During the first ten months of 1937, the loss of man-days was 26,768,955. During April 1939, 4,876,744 man-days were lost and in May 1939, 3,515,751. The maximum loss of man-days in any of the first ten months of 1940 was 865,000 in October. The drop in man-days lost from 1939 to 1940 resulted from the fact that there were no really big strikes in 1940.

Table I on page 639 shows for the United States the number of strikes, workers involved and days lost, 1933–40. The year 1937 is still the record year in number of strikes since 1917. The number of strikes began to increase in 1933 and rose steadily through 1937. Since then, it declined steadily through 1940. Severity of strikes also decreased.

The monthly reports on strikes issued by the United States

Table IV.—*Causes of Labour Disputes in Great Britain, 1940, by Months*

Cause	J	F	M	A	M	J	J	A	S
Demands for wage increases	20	16	26	27	21	8	7	9	13
Resistance to wage reductions	..	..	2	7	..	..	..	3	..
Other wage questions	18	10	19	13	28	9	13	19	22
Hours	1	1	.	5	5	..	..	2	1
Employment of particular classes of people or individuals	15	14	13	18	21	6	8	9	26
Other working arrangements	11	13	14	15	15	6	9	7	19
Questions involving trade union principles	6	2	5	6	1	1	3*	..	1
Sympathetic strikes	2	1	3	..	1	..	..	1	1

Compiled from *The Ministry of Labour Gazette*, February-October 1940.
*"Other Questions."

Table V.—*Results of Labour Disputes in Great Britain Settled in 1940*

Results of Strikes	J	F	M	A	M	J	J	A	S
Settled in favour of labour	10	12	16	16	13	7	7	8	10
Settled in favour of employers	30	24	52	41	52	17	23	27	34
Settled by compromises	11	11	14	15	22	6	9	12	17
Negotiations pending, but work resumed	12	7	7	15	9	1	2	2	14

Compiled from *The Ministry of Labour Gazette*, February-October 1940.

Table VI.—*Strikes and Lock-outs in Canada*

Month	1939			1940		
	No. of disputes	No. of employees involved	Time loss in working days	No. of disputes	No. of employees involved	Time loss in working days
January	12	1,336	10,472	6	919	6,861
February	8	2,622	24,098	14	3,161	14,687
March	7	1,598	9,982	11	2,380	19,276
April	6	315	1,361	18	13,807	67,104
May	13	3,728	16,732	22	8,566	51,997
June	13	2,355	8,616	14	7,154	38,937
July	10	4,420	12,445	15	7,191	18,612
August	18	11,823	32,298	18	6,712	15,953
September	17	8,190	17,546	10	2,668	6,053
October	27	6,496	33,724	25	7,609	19,830
November	14	4,863	36,351	..	..	..
December	12	1,666	20,963	..	..	..
Total	122	41,038	224,588	153	60,166	259,310

Compiled from *Canadian Labour Gazette*. All 1940 figures preliminary.

Table VII.—*Trend of Labour Disputes in Canada, 1931–39*

Year	Number of disputes	Number of workers involved	Time loss in man-working days
1931	88	10,738	204,238
1932	116	23,390	255,000
1933	125	26,558	317,547
1934	191	45,800	574,519
1935	120	33,269	284,028
1936	156	34,812	276,997
1937	278	71,905	886,393
1938	147	20,395	148,678
1939	122	41,038	224,588

Canadian Labour Gazette, March 1940.

bureau of labour statistics indicated that close to one-half of the strikes of 1939 involved some question of union recognition, with wages the other major issue. This distribution was characteristic of 1937 through 1940. Tables IV and V show the causes of British disputes and their results. Two contrasts with the United States situation stand out—in Table IV the absence of "union recognition" unless included in "questions involving trade union principles," and in Table V the large percentage of the strikes which ended definitely in favour of the employers.

Canada had only 153 strikes in the first 10 months of 1940, involving 60,166 workers. (*See* also UNITED STATES: *Labour Problems.*) (D. D. L.)

Submarine Warfare. In considering this summary[1] it must be understood that figures given herein cannot be officially verified. Reports emanating from one adversary are countered by denials from the opposite camp and the statistician finds himself in a maze of conflicting statements. There is good reason to believe, based both on experience during the war of 1914–18 and on neutral estimates, that British acknowledgments of naval and shipping losses are to be given considerably more weight than corresponding reports from axis sources. The fog of war thickens as the struggle becomes intensified and it is improbable that it will be dispelled until the dawn of another peace.

At the beginning of the war in 1939 there was little reason to suspect that submarine warfare would assume the important role it played in the critical year of 1917. Germany had but 65 submarines and most of these were small, short-range craft. German shipyards had not the capacity for mass production of submarines that it had in 1914, although this was capable of considerable expansion. It was believed that these U-boats had too short a radius of operation from their North sea bases to be truly effective against Atlantic shipping lanes. At the beginning of 1940 the general feeling was that Great Britain, through its vastly superior surface fleet, had effective control of the sea and that its blockade of Germany would provide the decisive factor in a somnolent war. Both Allies and neutrals were unable to foresee that the quickened tempo of submarine warfare would, by year's end, become the greatest menace with which the British empire had to contend.

The War on Shipping.—To arrive at the monthly merchant tonnage losses given in the table on p. 641 recourse has been had to two neutral and two British sources, all of which are considered reliable to the extent of information available to them at the time and all of which agree within reasonable limits. In cases of disagreement the higher figure has been taken as probably the most accurate and hence the grand total of losses for the year is slightly higher than given in other estimates. German claims have not been considered, as they are unquestionably exaggerated, the reason for this lying partially in the fact that the nazis are dependent upon submarine commanders for information. After

[1]All assertions or opinions contained in this article are the private ones of the writer and are not to be construed as official or reflecting the views of the U.S. Navy department or of the naval service at large.

launching torpedoes a submarine normally dives deep to escape counterattack and is unable to observe actual results, sometimes mistaking the explosion of depth charges for that of its torpedo against the victim's hull. As U-boat commanders vie with each other for the prestige of "most tonnage sunk" it is but natural that their reports are coloured by wishful thinking.

The figures in the table are, in round numbers, the totals of merchant tonnage lost by the Allies and neutral tonnage usable by them. A total tonnage loss during 1939 of 901,344 tons including 130,000 tons lost by Germany was reported. Later information raised this figure and it appears that approximately 781,000 tons exclusive of German losses were sunk during 1939.

Allied and Usable Neutral Tonnage Losses

1939 Total Losses		781,000
1940	Monthly Average	Grand Total
January	231,000	1,012,000
February	242,000	1,254,000
March	150,500	1,404,500
April	56,000	1,460,500
May	244,000	1,704,500
June	465,000*	2,169,500
July	317,500	2,487,000
August	380,500	2,867,500
September	405,000	3,272,500
October	421,000	3,693,500‡
November	297,000	3,990,500
December†	339,000	4,329,500
Total for year 1940		3,548,500

*Includes heavy losses during evacuation of British troops from France.
†Later information will probably increase this figure.
‡For comparative purposes: Up to November 1 the British Admiralty admitted total allied and neutral losses of 3,547,000 tons and Hanson W. Baldwin, naval expert of the New York *Times*, estimated 3,400,000 tons, both since the beginning of the war.

That the British admiralty recognized the submarine threat is evident from action taken early in Jan. 1940 to establish a vast new minefield of about 200,000 mines and nearly 500 mi. in length in the North sea. Another clue to British concern was their action in requisitioning, effective Feb. 1, all merchant tonnage of the United Kingdom and colonies, affecting nearly 17,000,000 tons. In February, however, Winston Churchill, first lord of the admiralty, declared that the convoy system was effective and that the odds were 500 to 1 against the sinking of a convoyed ship.

During the early months of 1940 mines and aircraft proved to be almost as effective against shipping as were submarines; aircraft were particularly dangerous to small ships in coastwise traffic. With the effective application of degaussing gear and the increase in minesweeping squadrons the menace from mines, magnetic and otherwise, steadily decreased.

Losses due to submarines fell off sharply during March and April and the Allies optimistically attributed this to their own superiority at sea. It is recognized that this phenomenon was due to the concentration of U-boats in home waters prior to and during the Norwegian sideshow. To offset the loss of prestige suffered in Scandinavia as well as the loss of potential submarine bases in the Norwegian fjords the British profited by gaining direct control of about 4,000,000 tons of Norway's shipping, although a large portion of this was already sailing under British charter.

During May and June, events of gravest import to the success of the counterblockade occurred on the continent. The invasion of the Low Countries yielded submarine building facilities of incalculable value to the nazis and probably also added a few Dutch submarines to their flotillas. With the downfall of France Germany obtained not only more building yards and perhaps a number of French submarines but also, of infinitely greater value, excellent advanced submarine bases at Cherbourg, Brest, Lorient, Bordeaux. The occupation of these made it possible for their short-range submarines to be used successfully in harrying the Atlantic trade routes and the effects were soon felt.

June brought the highest merchant tonnage losses of the war, 465,000, but a considerable share of these was incurred in the evacuation of Dunkirk and other French ports. The entrance of Italy into the war in this month was a factor greatly strengthening the counterblockade, adding about 130 submarines to the axis flotillas. Fascist headquarters promptly announced that a number of these would be used in the warfare in the Atlantic.

As a result of nazi conquests most of the merchant fleets of both Holland and Belgium came under complete British control. The former had afloat about 3,000,000 tons, but Belgium boasted only about 400,000 tons of commercial bottoms. Some Danish and French shipping was also known to have come under the British flag. A neutral study made in July indicated that the merchant fleet available to Britain was then stronger than at war's outset.

In July Berlin announced a "quickened tempo" of submarine warfare and in August officially declared a "total blockade" of Great Britain. These pronouncements were given force by a steadily mounting toll of losses from July through October, when the startling monthly figure of 421,000 tons was reached. For September and October the nazi high command laid extravagant claim to a total of 1,308,600 tons (946,000 by submarines alone) in contrast to the probable total figure of 826,000 tons for the same period. But the latter figure was alarming enough and prompt counteraction was taken by the British. In early September the already historic "destroyers for bases" deal was consummated with the United States, augmenting the British destroyer force by 50 overage but still effective ships. Extensive mining of possible submarine bases, from Norway to the Bay of Biscay, was carried out by the royal air force and heavy bombing attacks on actual U-boat havens were conducted with increasing frequency throughout the autumn. As Britain had by this time obtained about all ships possible from other sources British agents were sent to the U.S. to purchase immediately all available bottoms and to contract for the building of new freighters. On the entry of Greece into the war in late October the 1,800,000 tons, mostly antiques, sailing under the Greek flag were placed at Britain's disposal and early in November a small acquisition was made through requisition of the 24 Estonian, Latvian and Lithuanian vessels then in British ports. In spite of heavy bombings British shipyards continued to turn out new ships at breakneck speed and it was reported that during the first nine months of 1940 they completed a total of 426,551 tons.

In October the new U-boat tactics (*see* below) were becoming destructively effective and at the same time it was reported that "some dozens" of Italian submarines had been shifted from central Atlantic to more fruitful north Atlantic shipping lanes. New depredations by surface raiders, stuka bombers and speedy torpedo boats added to the gravity of the situation and led Prime Minister Churchill to declare in the commons that the recrudescence of submarine warfare constituted the most serious threat to the empire which, if continued, "will touch the life of the state." This speech was closely followed by vicious air assaults on submarine building yards in Germany.

Tonnage losses fell off somewhat during November and December but this can be attributed to the season of gales in the north Atlantic. In late November the minister of shipping admitted that losses exceeded new construction and that it was necessary to look to the United States for replacements. These losses were reflected by a stricter food rationing in Britain in December although as yet no real hardships were felt. Late in the year the minister of shipping further indicated the stringency by suggesting that all axis-controlled shipping in United States ports be turned over to Britain, and at year's end rumour was rife that a deal for many more over-age destroyers was pending.

Throughout the year British submarines were active against

German lines of supply to Norway, France and the "invasion ports." They achieved a moderate success and claimed many ships sunk, but no figures were by Jan. 1, 1941 available as to total nazi tonnage involved.

As an indication of the increasing effectiveness of submarine warfare it is noted that during the first four months of the war, Sept.–Dec. 1939, the average monthly loss was somewhat less than 200,000 tons; during the same period in 1940 it had mounted to nearly 400,000 tons. This was disturbing, but as yet fell far short of the figures for the first six months of unrestricted submarine warfare in 1917 when losses averaged over 600,000 tons a month. The capability of Britain, however, to cope with the situation was much less than during the war of 1914–18. After the French debacle it became necessary for the royal navy to assume entire responsibility for the Mediterranean, strengthening its forces there at the expense of other areas. At the same time the blockade was stretched to the limit to cover the entire European coastline and this called for further dispersion of forces. Heavy losses in destroyers, the arch-foes of submarines, added to the difficulties of the situation. As a result convoys travelled under too light an escort and there was an acute shortage of anti-submarine vessels. The neutrality of Eire was a further handicap as it denied use of excellent naval bases on the west coast of that island and required patrol and escort vessels to make much longer runs to English and Scottish ports; at the end of the year diplomatic and economic pressure were being placed on Eire to overcome this obstacle. With the expected heavy spring U-boat offensive a super-effort would be required to prevent losses from exceeding the grimmest figures of the war of 1914–18.

Submarines in Naval Actions.—The submarine in 1940 had shown no particular effectiveness against naval vessels in the war. It is probable that the Germans employed most of their U-boats against merchantship objectives except during the Norwegian campaign, but it is believed that British submarines were on continual prowl for naval craft, without any notable successes. It is possible, however, that they proved valuable, as they did in 1914–18, against U-boats; news of such actions was strictly censored and the results could only be surmised. The lack of success of both British and axis submarines against capital ships was undoubtedly largely due to the superior speed and manoeuvrability and to the water tight compartmentation of such targets. No major naval craft had by Jan. 1, 1941 been definitely sunk by a submarine since the "Royal Oak" in Oct. 1939.

From such items as have been made public it is assumed that British submarines were largely used in close blockade of enemy naval bases and, after April, in a war against German lines of communication to Norwegian and French ports and against the Italy-Libya route. Close blockade duty, due to the invariable presence of minefields, was unusually hazardous and probably accounted for a large percentage of British losses.

In Jan. 1940 the British admiralty announced the loss of the submarines, "Seahorse," "Undine" and "Starfish," the first submarines lost by enemy action, while on a dangerous mission in Heligoland Bight. Two British destroyers were also lost in January, by enemy torpedo or mine. In February another destroyer was acknowledged lost by submarine action while on convoy duty.

During the Norwegian campaign submarines seem not to have been used to the limit of their capabilities. German submarines are known to have been recalled from their Atlantic patrol and, from such meagre data as is available, they were probably placed on guard off the occupied Norwegian fjords to waylay any counter-attacks. Their lack of success was phenomenal; the nazis report only having sunk by submarine a former Polish destroyer (later verified) and 3 British transports (not verified). British submarines were stationed in the Skagerrak and along the Norwegian coast to operate against enemy naval forces and lines of communication. These appear to have been more successful in their mission and were rumoured to have penetrated the heavily mined Cattegat into the Baltic. On April 8, the day before the invasion, a British submarine torpedoed and sank the German troopship "Rio de Janeiro" with great loss of life. On April 10 the admiralty claimed that an enemy cruiser (class unknown) was torpedoed and probably sunk by submarine action. Neutral Swedish reports stated that on April 11 at least 6 nazi troopships were sunk in the Skagerrak; this was not verified. On April 15, Britain laid claim to 2 more troopships sunk by submarine in the Skagerrak and a few days later they acknowledged the loss of their submarine "Thistle" by enemy action. With heavy naval forces of both antagonists keeping the sea in a fairly restricted area the failure of submarines to strike more telling blows can probably be laid to faulty staff work.

During the invasion of the Low Countries and the fall of France submarines played a very minor role. British submarines were reportedly concentrated in the approaches to the channel to guard against invasion and to fend off interference with the evacuation from Dunkirk. Following the occupation of Dutch and Belgian ports it was rumoured that German submarines were being converted into transports for ferrying the army of invasion to England. This is considered improbable.

In early June the British acknowledged the loss of their auxiliary cruiser "Carinthia" (20,277 tons), a former luxury cruise ship, by submarine action; this was the first admitted loss of an auxiliary cruiser since the "Rawalpindi" disaster in 1939. Late that month the admiralty announced that a British submarine had attacked and damaged the German battleship "Scharnhorst" off Trondhjem fjord and, a few days later, that another nazi troopship had been sunk by submarine south of Norway. Early in July the Germans claimed to have torpedoed the new British aircraft carrier "Illustrious" but gave no further details; though possibly damaged, this fine ship was in service at year's end. Shortly thereafter the British admitted the loss of another destroyer by submarine action.

The surrender of France in June was a serious blow to the British submarine flotillas as well as to all British armed forces. France entered the war with 78 submarines and probably completed several more since; her known losses were only 2. While no definite figures were released it seems probable that of those remaining only a small percentage joined the "Free French" forces in Britain.

It is definitely known only that the world's largest submarine "Surcouf" (2,880 tons) and "several others" arrived in British ports. Of the remainder it is probable that the majority were immobilized under terms of the Franco-German armistice, although there were indications that some former French submarines were in 1940 operating under German command. This loss, combined with the stupendous gain in axis submarine strength when Italy entered the conflict, completely turned the tables of comparative submarine strengths against the British.

On July 10 occurred an action between two submarines: the British "Parthian" torpedoed and sank an Italian submarine at close range, the loss being admitted by the fascist high command. A few days later an Italian submarine torpedoed and sank a British destroyer, both actions taking place in the Mediterranean. Early in August the Germans claimed the U-boat sinking of another British destroyer and a British submarine, no details being vouchsafed. On the same date the Italians claimed that the British submarine "Oswald" had been rammed and torpedoed in the Ionian sea; the admiralty later confirmed this loss. In mid-August the neutral Greek cruiser "Helle" (2,115 tons), while at anchor at Tinos island, was mysteriously sunk by an unidentified submarine. In view of strained relations between Greece and Italy popular opinion laid this crime on Italy's doorstep, although the fascist press loudly blamed Britain for "another 'Athenia' case."

In early September Swedish newspapers reported the sinking by a British submarine of a large German transport, escorted by destroyers, in the Skagerrak with a total loss of about 4,000 lives. This was later confirmed by the admiralty which credited the achievement to the "Sturgeon." About the same time Italy laid claim to sinking a British warship, type not stated, by a submarine in the straits of Gibraltar. There was no verification and this claim must be classed as extremely doubtful.

During the Dakar incident in late September it was reliably reported that attacks were made by 3 French submarines on the British and "Free French" forces present. One torpedo struck but failed to sink a British light cruiser, while 2 of the submarines were sunk—one being the "Persee." Two British destroyers were also sunk in this action but apparently this was by gunfire rather than by submarine action. In the later (November) attack by this same force on Gambon the British report that the French submarine "Poncelet" was scuttled during the action off the coast of Senegal.

In mid-October the admiralty reported that British submarines attacked a German convoy, sinking, in addition to several supply ships, 2 escort vessels of unstated type. On the same date the fascist high command announced a gun duel between the Italian submarine "Toti" and the British submarine "Perseus," resulting in the sinking of the latter. On Nov. 4 the

British admitted the loss of 2 large auxiliary cruisers, "Laurentic" (18,724 tons) and "Patroclus" (11,314 tons), both by submarine action. On Nov. 12 Italy claimed that a submarine, while attacking a convoy, inflicted damage on an unidentified British cruiser. Shortly thereafter the Italians further claimed to have torpedoed but not sunk a British destroyer; this was undoubtedly the Canadian destroyer "Saguenay" which, while on convoy duty in the north Atlantic, was struck by a torpedo but limped safely into port.

As the year closed the small force of 6 Greek submarines stepped into the limelight in emulation of the heroic deeds of their landsman brothers. Greek headquarters reported that on Dec. 28 their small submarine "Papanicolis" slipped through a destroyer screen to sink 3 Italian troopships on the Brindisi-Valona run, with great loss of life.

Submarine Losses.—*Germany.*—As no admissions of any U-boat sinkings were divulged by the nazis it is extremely difficult to arrive at a reasonably accurate estimate of their submarine losses. The only information is that emanating from British and French sources and this has been neither official nor complete. British claims as culled from the neutral press mentioned only 27 individual sinkings of German submarines throughout 1940, but other responsible statements raised this figure considerably. Late in January Winston Churchill announced that half of Germany's original U-boat fleet had been exterminated. A few days later Cesar Campinchi, French minister of marine, declared that a total of 40 German submarines were accounted for by Allied action. These two statements agreed very closely. Late in February Mr. Churchill further estimated that Germany had only 35 submarines left. As Germany was believed to have entered the war with about 70 U-boats this indicated, if correct, either a high rate of destruction during February or a failure to add to their original flotillas by new construction. In early March, M. Campinchi reported that the French navy alone had sunk 12 German submarines since the beginning of the war. No further estimates of German losses were released until near the end of 1940 when British naval sources laconically reported that anti-submarine warfare "is taking a very good toll." There is good reason to believe that the British reports were not unduly optimistic. (In 1918 the writer had occasion to sit with British naval boards to determine individual cases of submarine losses and found them ultra-conservative, demanding positive proof before giving credit for a sinking.) Assuming that the earlier British claims were fairly accurate, an average loss of about 6 U-boats a month is indicated, or a total of 36 during the first 6 months of the year. Thereafter, due to the fall of France and the entry of Italy into the arena, it seems reasonable to believe that the German toll dropped to about 4 a month. It is estimated, therefore, that approximately 60 U-boats were destroyed during the year and a total of about 84 sunk since Sept. 1939. This rate of sinking is not nearly high enough to offset probable new construction. (*See* below.)

Italy.—The fascist high command, up to Dec. 14, 1940, officially conceded the loss of 7 of their submersibles. British reports of individual actions in which Italian submarines were lost reached a total of 10 and, just prior to her collapse, France claimed the destruction of "several" Italian submarines. In early December British sources claimed that 21 Italian submarines had been sent to the bottom. It is apparent that Italy suffered heavy losses and that her rate of replacement was not high.

Great Britain.—Up to and including Dec. 22 the admiralty acknowledged the loss of 22 submarines during the war. Press releases from Berlin noted but 9 individual claims of British submarines sunk by German action. On May 5, however, the nazis extravagantly claimed that 23 Allied submarines had been destroyed since the invasion of Norway, less than a month. No further summaries were released. Again it seems reasonable to place considerable credence in the British admissions for it must be remembered that England is still a democracy and that its people demand, and probably get, full knowledge of naval losses as soon as it can be safely released. An estimate of 25 British submarines lost during 1940 allows for a few which had not by Jan. 1941 been accounted for and is probably not far from the truth.

France.—Reports from the French, out of the war, can be presumed to be accurate. France acknowledged the loss of two submarines during the war and 4 since the war. Of the latter, 3 were accounted for by the actions off Dakar and Gambon; the fourth was possibly lost during the escape of light French forces from the British attack at Oran.

New Construction.—A vital factor in waging a successful war against shipping is the speed at which submarines can be built to augment the original flotillas and to replace lost vessels. At the end of the World War of 1914–18 Germany had achieved a maximum rate of 8.5 submarines a month, with production still increasing. As these were relatively large ships it is possible that, with the greater facilities available in 1940, the nazis were producing smaller U-boats at double this rate. In fact, as early as January they reported launchings at the rate of one a day. Just a month later, however, this claim was offset by Winston Churchill's statement to parliament that new German submarines were "not coming out as fast as expected." In late March Norwegian fishermen reported large numbers of submarines in the North sea and neutral naval observers estimated that many of these were constructed during the winter. There appears to be but little doubt that the German flotillas in the spring of 1940 were considerably larger than those with which she entered the war.

Nazi production facilities were almost doubled in May–June by the capture of extensive shipyards in Holland, Belgium and France, and by the securing of a greater flow of raw materials in northern France and the taking over of several diesel engine plants. According to British estimates at least 40 Dutch shipyards were absorbed and were operating with local labour. It is probable that a number of partially completed submarines were likewise secured.

October press dispatches from London indicated the British belief that the Germans were then completing one large submarine (probably about 1,500 tons) a day, plus mass production of so-called "minnows" (250–500 tons). If true, this rate of construction is astounding and might well prove the decisive factor in the war. The partial shift to a large submarine by Germany is probably due to a desire to operate well out on the trade routes, where the escort of convoys is lighter and the percentage of success higher. Neutral sources reported in November the appearance on the high seas of huge U-boats, capable of 19 knots, heavily armed and carrying 20 torpedoes. The rumour is not too disquieting; the description might well apply to the modern submarines possessed by all great naval powers (Germany excluded) before the war.

No information was available concerning the rate of British submarine construction. In view of the exigencies of the situation it seems probable that their naval building facilities were in 1940 largely concentrated on destroyers and other anti-submarine craft.

Submarine Tactics.—During the early part of 1940 U-boats seemed to be following the time-honoured method of attacking singly and without outside assistance. As was to be expected with short radius boats operating from inconvenient German bases, attacks took place relatively near the coast. With the conquest of Norway, however, they ranged farther to sea and attacked convoys before they had picked up their strong escorts. These tactics were further simplified when submarine bases at such advanced posts as Lorient, Brest and Bordeaux had been occupied.

In the autumn, when submarine warfare began to take its deadly toll, it appeared that a new system of attack had been adopted. Fragmentary reports piercing the screen of censorship indicated that attacks were made by groups of two or more large, fast U-boats which had been concentrated on their quarry by radio reports from long-distance nazi planes. They were also reported to be equipped with anti-aircraft listening devices for detecting the approach of convoys at night. German reports of U-boats dodging the gunfire of escorting vessels would indicate that at least some attacks were made on the surface, during twilight or by moonlight. Convoys, it was reported, were broken up and the fleeing merchantmen attacked singly. The admitted weakness of Britain in cruisers, destroyers and other escort vessels might permit such daring tactics. By these tactics the Germans claimed that on one night 26 ships were shot out of one convoy! As the British announced a loss of 42 ships during that week this boast may not have been as bombastic as other claims. The British admiralty reported that it possessed full details regarding these new tactics.

During the World War of 1914–18 the wakes of torpedoes were frequently sighted at some distance from the target ship, in time to permit manoeuvring to avoid being struck. Up to Jan. 1, 1941 such cases were conspicuous by their absence and led to the assumption that the nazis have at least partially perfected a wakeless torpedo which gives no warning of approach by its telltale trail of bubbles. (*See* also BLOCKADE; INTERNATIONAL LAW; NAVIES OF THE WORLD; SHIPPING, MERCHANT MARINE; STRATEGY OF THE EUROPEAN WAR.) (E. E. HA.)

Subscription Books Bulletin: *see* AMERICAN LIBRARY ASSOCIATION.

Sudan: *see* ANGLO-EGYPTIAN SUDAN; FRENCH COLONIAL EMPIRE.

Sugar. No repetition of an acute world-wide sugar shortage, such as that of 1914–18, developed out of the European war, owing to a continuation of surplus production in 1940 in many countries and owing to various European governments having made forehanded preparation to increase sugar beet production. In Germany the 1940 sugar beet crop was reported as 20,000,000 metric tons[1], an ample supply, and comparable to the 1940 United States crop of 11,633,000 short tons of sugar beets which was the largest crop ever produced in that country. In the United Kingdom, although sugar was strictly rationed to minimize imports, the 1940 production was estimated at 520,000 metric tons of sugar. Following the War of 1914–18 the British government offered subsidies to encourage sugar production in the United Kingdom and built up such production from 50,000 tons in 1925 to 641,000 tons in 1934. Total production of sugar in Europe in the 1940–41 season is given by *Facts About Sugar,* November number, pages 19 and 20, in estimates of F. O. Licht, as 5,587,000 metric tons, which compares with 5,248,000 metric tons in the preceding year, 1939–40. Table I shows the F. O. Licht figures, as given by *Facts About Sugar,* for various European countries in 1940–41 and 1939–40, omitting Germany and France for which there are no official figures.

Table I.—*Production of Sugar by Countries, 1939–40 and 1940–41*

Country	1940–41 metric tons	1939–40 metric tons	Country	1940–41 metric tons	1939–40 metric tons
U.S.S.R.	2,700,000	2,540,000	Yugoslavia	130,000	119,000
Great Britain	520,000	536,000	Rumania	110,000	145,000
Italy	500,000	478,000	Turkey	110,000	105,000
Sweden	300,000	311,000	Eire	100,000	65,000
Netherlands	285,000	242,000	Slovakia	70,000	54,000
Belgium	280,000	264,000	Bulgaria	38,000	25,000
Denmark	240,000	252,000	Switzerland	16,000	14,600
Spain	180,000	82,000	Finland	8,000	15,000

France normally produces 85% of its sugar requirements and imports 15% from colonies. Owing to the war, it was reported,

[1]Metric ton 2,204.6 lb. Short ton 2,000 lb. Long ton 2,240 lb.

France faced a sugar shortage in 1941, as did Norway, Finland, Greece and Switzerland.

Cuba again produced a surplus sugar cane crop in 1940 and again faced an acute problem of finding markets. Up to Sept. 30, 1940, Cuba had exported 1,767,936 long tons of sugar, leaving 1,574,260 long tons available for export and home consumption.

The 1940 United States sugar beet crop, estimated by the department of agriculture Nov. 1 as 11,633,000 short tons, slightly exceeded the previous record crop of 11,615,000 tons in 1938. The 1939 crop was 10,773,000 tons and the ten-year (1929–38) average was 8,937,000 tons. The yield in 1940 was 12·7 short tons per acre compared to 11·7 in 1939 and 11·3 for the ten-year average. Sugar cane production in the United States in 1940 was estimated at 4,671,000 short tons compared to 5,798,000 short tons in 1939 and the ten-year average of 4,096,000 short tons. The yield in 1940 was the same as for the ten-year average, 17·4 tons per acre, a sharp decline from 22·5 tons per acre in 1939. Sugar produced from the 1940 cane crop was estimated, 96 equivalent, at 408,000 short tons compared to 507,000 tons in 1939 and the ten-year average of 326,000. Of the 1940 crop of sugar cane, 3,824,000 short tons were produced in Louisiana and 847,000 tons in Florida. In 1939 Louisiana production was 5,084,000 tons and that of Florida 714,000 tons. (S. O. R.)

Table II.—Sugar Beet Production by States, 1939 and 1940

State	1940 short tons	1939 short tons	State	1940 short tons	1939 short tons
California	2,620,000	2,699,000	Nebraska	972,000	790,000
Colorado	1,927,000	1,543,000	Wyoming	550,000	539,000
Montana	1,134,000	894,000	Utah	470,000	683,000
Michigan	1,062,000	1,033,000	Ohio	366,000	363,000
Idaho	1,058,000	985,000	Other states	1,474,000	1,244,000

Suicide Statistics. During 1938 there were 19,802 deaths from suicide in the United States; these constituted 1·4% of the deaths from all causes and resulted in a death rate of 15·2 per 100,000 of total population. In the same year Canada had 946 deaths from suicide and the death rate was 8·5 per 100,000; for England and Wales, the corresponding figures were 5,316 and 12·9 per 100,000 respectively. For each of these countries, the average annual death rates for the period 1935–37 were somewhat lower than those observed for 1938. Provisional records for the United States indicate that the death rate from suicide in 1939 was appreciably lower than that for 1938; current indications for the first half of 1940 point to a suicide death rate not essentially different from that for 1939.

Death rates from suicide in the most recent year available for a number of countries will be found in the appended table. Austria headed the list with a rate of 38·1 per 100,000 total population in 1937, followed closely by Hungary (32·0 in 1937), Germany (28·6 in 1936), Czechoslovakia (27·5 in 1937) and Switzerland (24·6 in 1938). Estonia, Japan and Denmark rank next in order, all with suicide rates of more than 20 per 100,000. Only three countries, Eire, Northern Ireland and Spain have recorded suicide death rates of less than 5 per 100,000 total population.

In view of the current international situation, it is interesting to observe that in the World War of 1914–18, the death rates from suicide in the principal participating countries fell below the levels prevailing in the years of peace immediately preceding and following hostilities. Whether the same experience will be found in the countries engaged in the conflict which began in 1939 remains to be seen.

When the suicide death rate in the United States for 1938 was analyzed according to race, white persons were found to have a rate of 16·4 per 100,000 population, while that for Negroes was only 4·8 per 100,000; the corresponding rates in 1937 were 16·1 and 4·8 respectively. Suicide death rates are appreciably higher among males than among females. Thus, the death rates in the United States in 1938 for white persons were: males, 25·4; females, 7·3.

Annual Death Rates from Suicide per 100,000 Total Population in Certain Countries for Specified Years

Country	Year	Death Rate per 100,000	Country	Year	Death Rate per 100,000
Austria	1937	38.1	Ireland, Northern	1938	4.2
Australia	1938	10.8	Italy	1938	7.2
Belgium	1937	17.8	Japan	1936	22.0
Bulgaria	1936	10.0	Lithuania	1937	8.7
Canada	1939	8.6	Netherlands	1938	8.5
Czechoslovakia	1937	27.5	New Zealand	1938	12.4
Denmark	1938	20.8	Norway	1937	6.9
Eire	1938	3.3	Portugal	1937	10.7
England and Wales	1938	12.9	Rumania	1937	10.3
Estonia	1937	23.0	Scotland	1938	9.2
Finland	1938	18.8	Spain	1935	3.9
France	1936	19.5	Sweden	1936	16.7
Germany	1936	28.6	Switzerland	1938	24.6
Hungary	1937	32.0	United States	1938	15.2

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Sulphanilamide: *see* ARTHRITIS; BACTERIOLOGY; CHEMISTRY, APPLIED; CHEMOTHERAPY; DERMATOLOGY; DENTISTRY; EYE, DISEASES OF; GYNAECOLOGY AND OBSTETRICS; INDUSTRIAL RESEARCH; MEDICINE; NERVOUS SYSTEM; SURGERY; TUBERCULOSIS; UROLOGY; VENEREAL DISEASES.

Sulphapyridine: *see* CHEMOTHERAPY; COLD, COMMON; NERVOUS SYSTEM; PNEUMONIA; SURGERY; TUBERCULOSIS; UROLOGY.

Sulphur. The United States is the outstanding sulphur producer of the world, with about three-quarters of the entire output. Italy is a poor second, with one-sixth, and Japan third, with one-fifteenth; all other producers are so small as to be negligible so far as the world industry is concerned.

World production reached almost 3,000,000 metric tons in 1929, dropped to 1,625,000 tons in 1932 and recovered to the former level in 1937. Italian production changed little, while that of Japan was increasing. United States production rose to a new high record of 2,742,000 long tons in 1937, decreasing to 2,091,000 tons in 1939, but shipments were 2,234,000 tons, reducing stocks to 4,000,000 tons. Exports in 1938 were 652,800 tons, chiefly to Canada, United Kingdom and Australia. (G. A. Ro.)

Sumatra, which lies northwest of Java and which is closely adjacent to the Malay peninsula along its northwestern coast, is after Java the richest and after Borneo the largest of the islands of the Netherlands Indies archipelago. Its area is 163,145 sq.mi.; population (1930) 8,238,570. It is almost bisected by the Equator, lying between 5° 4′ N. and 5° 59′ S. It contains a long mountain range called the Bukit Barisan ("array of mountains") of which Mount Indrapura has an elevation of 13,700 ft. and Mount Ophir of 10,483 ft. The arable regions of the island are divided between native rice culture and European plantations which specialize in rubber and coffee. The mineral resources of Sumatra include coal, oil, gold and silver. It shared in 1940 in the general drive to make the Netherlands Indies more self-sufficient and more capable of supplying its own industrial needs since this huge colonial empire was thrown on its own resources by the German occupation of the Netherlands. High-octane gasoline plants for refining oil were set up and the industrial program for Sumatra included the construction of a smelter for producing aluminium oxide from bauxite, an aluminium-rolling and wire-drawing mill and an aluminium-ware factory, besides a major chemical plant and a paper mill. (W. H. CH.)

Sun: *see* ASTRONOMY.

Sunday Schools.

The World's Sunday School association is a federation of 51 national and international bodies interested in Christian religious education through the Sunday school and allied agencies. At Oslo, in 1936, a survey reported 369,510 Sunday schools in 129 countries, with 3,145,895 teachers and 34,139,624 scholars.

The quadrennial meeting of the council of the W.S.S.A., transferred from Durban, South Africa, because of war conditions, was held at Lake Mohonk, New York, May 8–11, with representatives of 20 countries present. Sir Harold Mackintosh, Halifax, England, was re-elected president, and Dean Luther Allan Weigle, Yale university, chairman of the council and board of managers. Dr. James Kelly, Glasgow, and Dr. Forest L. Knapp, New York, were elected general secretaries. Plans were initiated for an International Congress on Christian Education, to be held in Mexico, July 16–20, 1941.

The International Council of Religious Education, including 48 Protestant denominations in the United States and Canada, at its annual meeting in February, adopted a comprehensive report on basic philosophy and policy; and this has been published under the title *Christian Education Today*. The passage by the New York legislature of a law authorizing the release of public school pupils, at their parents' request, for stated periods of religious instruction, and the decision of the school board of New York city to accede to such requests, aroused new interest in the perplexing problem of how best to relate religious faith to public education, maintaining religious freedom.

In Europe the work of the Sunday schools was gravely hampered by war conditions. The Austrian Sunday School union was obliged to disband, and work in Albania ceased with Italian occupation. In Czechoslovakia, Finland and Poland work was concerned largely with the relief of refugees. The South African Sunday School union celebrated its 25th anniversary, and the Sunday School Promotion league at Shanghai, maintained by young Chinese laymen, its 20th anniversary. (L. A. WE.)

Sunshine: *see* METEOROLOGY.

Superphosphates.

The bulk of the phosphate rock output of the world is used in the production of superphosphates for fertilizer manufacture, of which there are three standard grades, containing 16%, 32% and 45% of available phosphoric acid. World production of superphosphates is of the order of 16,000,000 metric tons, as compared with 12,000,000 tons of phosphate rock. The chief producing countries and their percentages of the total are as follows: United States 25%; Japan 13%; Italy 9%; France 9%; Australia 8%; U.S.S.R. (Russia) 8%; Germany 7%; and Netherlands 3%; totalling 82%. Intermediate producers, ranging from 500,000 tons down to 100,000 tons, include New Zealand, Denmark, Belgium, Spain, Sweden, Poland, South Africa and Latvia, totalling 16%. The remaining 2% is scattered among 14 minor countries. U.S. production in 1939 was 3,801,000 short tons, a rise of 6% from 1938, increasing to 4,200,000 tons in 1940. In 1938 58% of the phosphate rock was used in the production of superphosphates. (G. A. RO.)

THIS NEW OFFICIAL PHOTOGRAPH of the U.S. supreme court was made necessary by the appointment of another associate justice, Frank Murphy, in 1940. In the front row, left to right, are Associate Justices Roberts and McReynolds, Chief Justice Hughes, Associate Justices Stone and Black. In the rear row are Associate Justices Douglas, Reed, Frankfurter and Murphy

Supreme Court of the United States.

The year 1940 commemorated the 150th anniversary of the supreme court. Following are some of the decisions of 1940:

Administrative Law. —The court held that there may not be judicial review of determinations by the secretary of labour under the Walsh-Healey act which governs labour conditions in companies receiving government contracts (*Perkins* v. *Lukens Steel Co.*, 310 U.S. 113); or of a presidential proclamation increasing a duty under the flexible tariff provisions of the Tariff act of 1930 (*United States* v. *George S. Bush & Co., Inc.*, 310 U.S. 371); or of orders of the National Labor Relations board with respect to the election of collective bargaining representatives or the certification of such representatives by the labour board. With respect to judicial review of orders of the National Labor Relations board, the court held that the statutory review provided by section 10(f) of the Wagner act is restricted to orders prohibiting unfair labour practices and that representation proceedings are no concern of the courts (*N.L.R.B.* v. *Waterman S.S. Co.*, 309 U.S. 206).

The responsibility of the administrative agencies to congress rather than the courts, except where congress has specifically provided for judicial review of administrative determinations, was emphasized in an opinion in a case involving the Federal Communications commission. The United States court of appeals for the District of Columbia had reversed denial by the Federal Communications commission of an application for a permit to construct a radio broadcast station, but the supreme court upheld the Federal Communications commission (*Federal Communications Commission* v. *Pottsville Broadcasting Co.*, 309 U.S. 134).

Civil Rights. —Personal rights of individuals with respect to freedom of speech, press and religion were protected by the court in all instances in which individuals claimed violation of such rights in criminal proceedings. Handbill ordinances of three cities which prohibited the distribution of handbills, circulars, pamphlets, etc., in streets and alleys of the cities, were found to abridge freedom of the press and freedom of speech in violation of the due process clause of the 14th amendment to the constitution (*Young* v. *California*, 308 U.S. 147); (*Snyder* v. *Milwaukee*, 308 U.S. 147); (*Nichols* v. *Massachusetts*, 308 U.S. 147).

An ordinance in a New Jersey municipality prohibiting house-to-house distribution of literature without a permit from municipal authorities was held an unconstitutional abridgement of freedom of the press (*Schneider* v. *The State* [*Town of Irvington*], 308 U.S. 147). A Connecticut statute prohibiting solicitation for religious contributions without approval was likewise held to be unconstitutional as censorship of religion (*Cantwell* v. *Connecticut*, 310 U.S. 296). Finally, the court sustained a state regulation requiring its pupils in the public schools on pain of expulsion to participate in a daily ceremony of saluting the national flag while reciting the pledge of allegiance (*Gobitis* v. *Minersville School District*, 310 U.S. 586).

On the other hand, a state may, by legislation, provide for the commitment of psychopathic persons without a denial to them of their constitutional safeguards (*Minnesota ex rel. Pearson* v. *Probate Court*, 309 U.S. 270).

Copyright.—The court ruled that the principle requiring apportionment of profits in cases of patent infringement is applicable to copyright infringement; that is, that an infringer shall be liable for "all the profits which the infringer shall have made from such infringement" (*Sheldon et al.* v. *Metro-Goldwyn Pictures et al.*, 309 U.S. 390).

Criminal Law. —The criminal prosecution provisions of the Texas Anti-Trust law were upheld despite the claim that such exemption from the criminal provisions accorded agricultural products and livestock while in the hands of the producer or raiser is a denial of equal protection of the laws in violation of the 14th amendment. In sustaining the Texas law, the court overruled an earlier case containing an identical exemption. The opinion states that the earlier case (*Connolly* v. *Union Sewer Pipe Co.*, 184 U.S. 539) "has been worn away by the erosion of time, and we are of the opinion that it is no longer controlling" (*Tigner* v. *Texas*, 310 U.S. 141).

Labour. —Probably the most important labour case from the standpoint both of public interest and of effect on future litigation was *Apex Hosiery Co.* v. *Leader* (310 U.S. 469). In that case the court held that the Sherman

Anti-Trust act was not applicable to a sit-down strike, even though it resulted in substantially restraining the interstate transportation of the product of the plant. Labour unions are liable under the anti-trust laws, according to this decision, only when their activities have the purpose or the effect of so interfering with free competition in business transactions as to restrict production, raise prices or otherwise control the market to the detriment of purchasers.

The court sustained the National Labor Relations board in a number of salient points: An order certifying a union as collective bargaining representative under section 9(c) of the act (*A.F. of L.* v. *National Labor Relations Board,* 308 U.S. 401) and an order directing a "run-off" election in a representation proceeding under section 9(c) (*National Labor Relations Board* v. *International Brotherhood of Electrical Workers,* 308 U.S. 413). It also held that a circuit court of appeals, reviewing an order in a consolidated proceeding involving unfair labour practice and employee representation, had no authority to modify the labour board's direction of election in the representation proceeding by requiring that an independent union be included on the ballot at an employee election with two national unions (*National Labor Relations Board* v. *Falk Corp.,* 308 U.S. 453).

Only the labour board can institute proceedings to punish a recalcitrant employer for contempt (*Amalgamated Utility Workers* v. *Consolidated Edison Co.,* 309 U.S. 261). The board can also order an employer to cease giving effect to contracts entered into with individual employees through a collective bargaining committee (*National Licorice Co.* v. *National Labor Relations Board,* 309 U.S. 350). The jurisdiction of the board has been held to extend to a company (engaged in the dyeing and finishing of textiles) even though it does only about 1% of the national total business in the industry (*National Labor Relations Board* v. *Bradford Dyeing Assn.,* 310 U.S. 318).

Anti-picketing laws were declared unconstitutional in two cases as an impairment of freedom of speech and of the press in violation of the due process clause of the 14th amendment (*Thornhill* v. *Alabama,* 310 U.S. 106; *Carlson* v. *California,* 310 U.S. 85).

However, in *Milk Wagon Drivers' Union* v. *Lake Valley Farm Products, Inc.* (311 U.S. 91), secondary boycott was, for the first time, legalized. In that case it was held that picketing of cut-rate milk stores by a union of milk delivery men to protect union wage scales and working conditions against the threat resulting from competition of cut-rate dairy selling only to cut-rate stores through independent contractor drivers may not be enjoined. Although the picketing constituted an interference with interstate commerce in violation of the Anti-Trust act, it was not subject to injunction because a labour dispute was involved.

Another decision held that all employees of interstate motor carriers other than those whose work affects safety of operation are subject to the provisions of the Fair Labor Standards act of 1938 (*United States* v. *American Trucking Associations, Inc.,* 310 U.S. 534).

Not since the Fansteel case outlawing sit-down strikes did the labour board receive so severe a reversal as in the Republic Steel case (*Republic Steel* v. *National Labor Relations Board,* 311 U.S. 7). In that case the supreme court held that no punitive measures or fines may be devised by the board and imposed on employers, even though the board may think that their imposition would effectuate the policies of the Labor act. The power conferred on the board to order employers to take "affirmative action" to remedy violations, although broad, has not yet reached this extreme.

Taxation.—*Federal.*—Tax evaders were strongly reminded by the supreme court that "technical considerations, niceties of the law of trusts or conveyances, or the legal paraphernalia which inventive genius may construct as a refuge from surtaxes should not obscure the basic issue" (*Helvering* v. *Clifford,* 309 U.S. 331). Nor is "the government required to acquiesce in the taxpayer's election of that form for doing business which is most advantageous to him" (*Higgins* v. *Smith,* 308 U.S. 473). The court set forth the requirements for avoiding applicability of the rule taxing a husband on income payable to his divorced wife in lieu of alimony. A taxpayer seeking to escape taxation of the income from an irrevocable trust agreement executed in favour of his wife prior to a divorce decree must establish that the law of the state, in which the divorce decree was entered, and the alimony trust fully discharge him from his obligation to support and maintain his wife (*Helvering* v. *Fitch,* 309 U.S. 149; *Helvering* v. *Fuller,* 310 U.S. 69). On the other hand, the failure of a taxpayer to show by clear and convincing proof that the court, which approved the trust as part of its divorce decree, gave him a full discharge of his obligation of support and lacks the power to add to his personal obligations in any circumstances, renders him taxable (*Helvering* v. *Leonard,* 310 U.S. 80).

The court denied a tax-exempt status to a transaction whereby all the profits of a corporation were conveyed to another corporation in consideration of cash and bonds of the transferee, all the assets of the transferor being distributed to its sole stockholder (*Le Tulle* v. *Scofield,* 308 U.S. 415).

State and Local.—The court greatly restricted the scope of the commerce clause of the constitution to prevent evading local sales tax by placing orders in interstate trade. Although the taxpayer purchases a commodity outside the state for shipment within the state, the court held in a series of cases that such interstate commerce must pay its way (*McGoldrick* v. *Berwind-White Coal Mining Co.,* 309 U.S. 33). A state or local tax is not unconstitutional unless it has such a "regulatory effect" as to prove discriminatory. The fact that such a tax does, in some measure, affect interstate commerce or increase the cost of engaging in such commerce does not make the tax unconstitutional (*McGoldrick* v. *Felt & Tarrant Mfg. Co.; McGoldrick* v. *A. H. Du Grenier, Inc.,* 309 U.S. 70; *McGoldrick* v. *Compagnie Generale Transatlantique,* 309 U.S. 430).

In the fifth case, however, levy of the New York tax was held to be an unconstitutional infringement of congressional regulation of foreign commerce. The tax in this case was applied to fuel oil sold and delivered as ships' stores to vessels engaged in foreign commerce after manufacture from crude oil imported under bonds given by the importer under customs laws and regulations. Exemption from state taxation, the opinion reasoned, "is implicit in the congressional regulation of commerce presently involved" (*McGoldrick* v. *Gulf Oil Corp.,* 309 U.S. 21).

Trade Regulation.—For the first time by direct decision, the court found that the constitution grants to congress power to fix prices of commodities generally where the sales are in or affect interstate commerce. The issue arose in a case involving the constitutionality of the Bituminous Coal act of 1937. The authority to exercise this power, the court determined, does not depend on the existence of a threat to health and morals or a question of conservation of resources.

Those matters relate only to consideration of policy and are no concern of the courts.

In the so-called "Madison Oil case," involving the first criminal prosecution under the Anti-Trust law, the court held that section 1 of the Sherman act was violated by the adoption by a group of oil companies of a program of buying up "distress" gasoline at what was purported to be the fair market price in order to avoid the adverse effect on the price of gasoline generally of the sale of "distress" gasoline at "distress" prices. The court found from the evidence that the "real and ultimate" purpose of the combination was to raise the price of gasoline to jobbers and consumers (*United States* v. *Socony-Vacuum Oil Co., Inc.,* 310 U.S. 150).

The Sherman act also limits the "monopolistic powers" granted by the patent laws to a patentee. This was made clear in another case which also involved the sale of gasoline. The court ruled that a corporation holding patents covering a gasoline anti-knock compound, by inserting in refiners' licences a provision prohibiting the sale of treated gasoline to jobbers not licensed by the patentee corporation, had exceeded the limited monopoly granted it by the patent laws. By such practice it violated the Sherman Anti-Trust act in that the jobber-licensing system gave the corporation power to control prices and market practices of jobbers (*Ethyl Gasoline Corp.* v. *United States,* 309 U.S. 436). (*See* also EDUCATION: *Court Decisions.*) (B. WE.)

Surgery. **Chemotherapy.**—During 1940, as might be expected, the application of chemotherapy was widely extended including not only its use when infections have developed, but also as a prophylactic agent against the onset and development of infection. A striking example is the treatment of compound fractures of bones. In compound fractures most bacterial growth can be inhibited by the use of sulphanilamide placed in direct contact with the soft tissues. There is no deleterious effect of the drug as far as healing of the fracture is concerned. This method of introducing sulphanilamide and other agents with similar antiseptic properties into wounds obtained during battle has become almost a routine procedure. Supplementing this, the drug is given by mouth in doses sufficient to maintain a safe concentration of it in the blood and tissues.

A new drug, sulphathiazole, was used extensively in the treatment of staphylococcic infections and was particularly efficacious in the treatment of such bone infections as osteomyelitis. It likewise has been of value in other types of infection, both local and general, even in cases of septicaemia (blood poisoning) in which the staphylococcus is the infecting organism.

Some of the disadvantages of sulphanilamide are the nausea and discomfort which some patients experience. A related chemical agent, sulphapyridine, was found to have properties similar to those of sulphanilamide, and in many cases of pneumococcic pulmonary infections it proved to be of even greater value. In doses necessary to achieve results it seemed to be tolerated better by the patient than sulphanilamide.

These three chemical compounds have likewise been used in other types of infections and have obtained noteworthy results in certain types of infections of the urinary tract, peritoneum (peritonitis) and in certain milder infections.

Vitamins.—The use of vitamins as replacement and substitution therapy in all types of cases in which haemorrhage is a factor, both operative and nonoperative, especially in those cases in which the vitamin deficiency has resulted from disturbances of the biliary or gastro-intestinal tract, has continued to be of great value in preventing serious bleeding, improving the patient's nutritional status and assisting in his recovery from certain surgical operations.

Synthetic compounds with vitamin K activity (anti-haemorrhagic) are available. These compounds can be given effectively by injections into the body as well as by mouth. Experimental work has shown that large doses of ascorbic acid are of value in assuring proper healing of wounds.

Plasma and Serum Transfusions.—Generally speaking, in the treatment of shock as the result of the loss of blood, transfusions of blood are of life-saving importance. There are other conditions in which shock occurs in which the loss of erythrocytes and haemoglobin is a secondary consideration, whereas the loss of serum and plasma produces a state of protein depletion which can be compensated for by the transfusions of plasma or serum. Such conditions are those associated with extensive burns and, in certain cases, with intestinal obstruction.

Plasma and serum transfusions have the advantage over blood transfusions in that they can be used in all cases regardless of the patient's blood group, and also that plasma and serum can be dried, stored and easily transported. Under these circumstances, when plasma or serum is given, all that is necessary is that it be dissolved in a small quantity of sterile physiologic salt solution. Its great value, therefore, under circumstances of necessity asso-

ciated with large numbers of casualties, either military or civilian, is apparent.

Oxygen Therapy.—The use of oxygen, by tent, catheter or mask, has been of great value in cases of oxygen depletion associated with pneumonia or other conditions in which absence of oxygen from the blood produces cyanosis. Two innovations in oxygen therapy—the administration of high concentrations of oxygen and the administration of helium and oxygen—were made possible by the development of a special apparatus.

The first procedure is used in cases in which oxygen lack is due to sluggish peripheral circulation, as in surgical and traumatic shock, and in which the increase in the amount of oxygen in the arterial blood made by the inhalation of high concentrations of oxygen is of value. In such a group would be cases in which gas is trapped in the body, such as in distension of the intestine with nitrogen, in gas gangrene, in surgical emphysema and in air embolism. In cases of severe anoxaemia an apparatus of the type of the B.L.B. mask enables the administration of high concentrations of oxygen not obtainable in the oxygen tent. In certain cases in which extensive surgical procedures have been necessary, increasing the normal oxygenation of the blood accelerates healing of the operative site, and abdominal distension and shock are reduced to a considerable degree.

The administration of helium, in combination with oxygen, has been particularly effective in combating the effects of conditions producing obstruction of the upper air passages.

Other Procedures.—Attempts were made to reduce the crippling effects of arthritis on the joints of the extremities by performance of surgical procedures in which the joint is opened and calcium deposits limiting its motion are excised. Remarkably good results were reported in many such cases. Since successful results followed removal of the patella (knee cap) when badly fractured, its removal has been advocated and carried out in certain types of arthritis of the knee joint.

In certain cases in which a constricting thick layer of scar tissue, sometimes infiltrated with calcium, occurs around the heart, cardiac efficiency is reduced and tissue fluids accumulate in various parts of the body from circulatory stasis. Removal of the constricting tissue from the heart has been successfully carried out, with restoration of cardiac efficiency to a remarkable degree.

Since it has been shown that free skin grafts function and grow for as long as eleven years after operation, the method of taking large skin grafts of full thickness from the abdomen or back and applying them to other areas of denudation has been so successful in the number of "takes" that it has been used with great advantage in grafting denuded areas about the face and neck from which a tumour or scar tissue, producing contracting deformities and unsightly scars, has been excised. (*See* also ANAESTHESIA; MEDICINE.)

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(WA. WAL.)

Surinam (DUTCH GUIANA), a Netherlands colony in northeastern South America; area, 54,291 sq.mi.; language, Dutch; capital, Paramaribo; governor, Dr. J. C. Kielstra. The population on Jan. 1, 1940, was 156,332 besides an estimated 19,032 bush Negroes and 2,616 Indians in the jungle. The chief cities are Paramaribo, 54,853, and Nieuw Nickerie, 3,788. The population in 1937 was 29·2% British Indian and 20·3% Javanese by nationality. There is an appointed governor and an elected council.

History.—German invasion of the mother country in May 1940 and the subsequent collapse of France brought grave problems to Surinam. Escaped convicts from French Guiana became a serious threat, while the Netherlands' own precarious position left Surinam, long supported in part from the home government's budget, in a bad economic and financial position. Potential attack from overseas loomed large in the eyes of many, and proposals were made that the United States establish naval and air bases for its own and Surinam's security.

Communications.—External communication is by steamship and air service. Internal communications are good along the coast where there are 137 km. of railway and fairly good roads, but are very poor in the interior.

Trade.—In 1939, imports, chiefly manufactured goods and foodstuffs, were valued at 7,882,353 guilders, 14·7% more than in 1938 (Netherlands, 34·5%; United States, 30%). Exports were 7,959,210 guilders, a 20·5% increase (United States, 71·8%; Netherlands, 16·3%). Bauxite, exported to the United States, was 64% of the export value in 1939 and was expected to be considerably greater in 1940.

In 1939, bauxite export volume was 504,062 tons. Gold and silver exports were valued at 629,294 guilders. Sugar (11,740 tons in 1939), balata, molasses, coffee, coco-nuts, peanuts, bananas, corn, peas, oranges, tobacco and rice are the main agricultural products.

Finance.—In 1939 government expenditures were 6,962,014 guilders; revenues, 4,034,476 guilders; the deficit being made up by the home government. The monetary unit is the guilder, officially valued at 52.8 cents U.S., and, since May 1940, tied to the Netherlands East Indies currency.

Education.—There are 132 schools (43 government), besides Indian and bush Negro schools in the jungle. On Jan. 1, 1940, there were 21,278 school children, 10,178 of whom were in the rural districts. (L. W. BE.)

Surplus Marketing Administration: *see* BUTTER; MEAT; POTATOES.

Swaziland: *see* BRITISH SOUTH AFRICAN PROTECTORATES.

Sweden, democratic monarchy of northern Europe. Area 173,347 sq.mi.; pop. (Dec. 31, 1939) 6,341,303. Chief towns (Dec. 31, 1939): Stockholm (583,621), Göteborg (280,601), Malmö (154,270), Norrköping (70,379). Ruler: King Gustavus V; language, Swedish; religion: Lutheran Christian.

History.—Sweden succeeded throughout 1940 to continue to walk the tightrope of peace, although completely surrounded by states involved in conflict or occupation by foreign troops. A large part of Sweden's army remained mobilized through the year, and its Bofors anti-aircraft guns, reputedly best in the world, shot down over 50 warplanes, mostly German, which for one reason or another had crossed the Swedish frontier. Naval defence was strengthened by the addition of some 60 vessels, such as motorboats and minesweepers. Sweden wanted planes, but 110 pursuit planes and bombers ordered in the United States were taken over by the United States government and transferred to Canada. A year's defence costs mounted to about 1,500,000,000 kronor by June, and came to about 200,000,000 kronor per month.

The Swedes have long regarded Finland as their first line of defence against their hereditary enemy Russia. Hence it was not too surprising that their national contribution to the Finnish cause in 1939–40 rose to over 500,000,000 kronor, and that several thousand volunteers bolstered the Finnish lines. Nevertheless Sweden refused to allow Allied troops to cross her territory or to send the 60,000 men asked from her. She had to watch the Russians advance into the eastern parts of Finland and establish themselves in naval and air bases all along the eastern shores of the Baltic.

On the 9th of April Sweden saw her western neighbours Denmark and Norway attacked. Fearful herself of the German juggernaut, with armament stores depleted by aid to Finland, and with one never-sleeping eye watching the U.S.S.R., Sweden felt she could do little for Norway. A few shipwrecked Germans passed through Sweden to Germany, and after the fighting in Norway was over, German soldiers and supplies were allowed to use Swedish rail facilities. Swedish sympathies were all with Norway, and several hundred prefabricated houses were sent to rebuild devastated towns.

Although Sweden kept out of the fighting, the war came to affect her severely. The struggle around Narvik in northern Norway destroyed the chief export route of Swedish iron ore; and after April the double blockade by Germans and British effectively cut off this insular neutral from her important trade with Britain, western Europe and the Americas. Through the tiny loophole on the Arctic in northern Finland persons could make

their way out, but most travelled through Russia the long route via Vladivostok. Bulk goods could not move through these costly and dangerous routes. Sweden adjusted herself to circumstances by making new trade agreements with Germany, and through Germany with Belgium and the Netherlands; she also extended a 100,000,000 kronor credit to soviet Russia in a two-year trade agreement. Possibly thus she could replenish her low stocks of coffee and sugar and obtain more oil and gasoline (consumption was down to 10% of pre-war, cars burning charcoal gas made in little trailer-cars). Poor crops of grain and hay accentuated Sweden's food and fodder problem.

Life and thought in Sweden remained comparatively free, though an editor was forced into retirement and an occasional issue of different papers was confiscated. In February the state set up a bureau of information to help unify the people and make them understand government policy. In the elections of September the discredited communists lost two seats in the riksdag and the Socialists disappeared. The voting evidenced confidence in the Social Democrats, who won 19 new seats for a clear majority in the second chamber, and exactly half of the membership of the first chamber. Most significant was that the vote gave the accolade of popular approval to the government's foreign policy. The riksdag (parliament) remained in constant session, keeping democratic control of the emergency measures of the government.

Education and Religion.—Scholars, elementary (1937), 581,131; continuation schools, 147,422; middle and secondary schools, 71,525; universities (1939), 8,521.

Banking and Finance.—One krona=23.855 cents (45.3740 cents at par). At the end of 1940 the Swedish riksbank held 672,000,000 kronor in metals and 750,000,000 kronor in foreign exchange; total of 1,422,000,000 kronor. State finance, 1939–40: ordinary budget, 2,767,150,300 kronor; capital budget, 525,563,400 kronor; 1940–41 (est.), ordinary, 1,663,626,300 kronor. Public debt (Dec. 31, 1939) 2,664,289,387 kronor.

Trade and Communication.—The year 1940 witnessed a general reorientation of trade; few statistics are available. Approximately 15–20% reduction in foreign trade. Sweden registered 70 new ships, including 37 motor vessels (of 80,000 tons) manufactured in Sweden, but this did not compensate for war losses. Gross tonnage (Jan. 1, 1940), 1,622,042. The import surplus for the first six months of 1940 was 450,000,000 kronor, caused by building up reserve stocks. 1939 trade: imports, 2,488,891,000 kronor; exports, 1,879,274,000 kronor.

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Sweet Potatoes. The 1940 crop of sweet potatoes was placed at 66,131,000 bu. in preliminary estimates by the department of agriculture. Production in 1939 was 72,679,000 bu. and the ten-year (1929–38) average was 72,436,000 bushels. Reduction in planting caused the smaller crop, as the yield per acre in 1940 was 83 bu., compared with 84.3 bu. in 1939 and a ten-year average of 84.6 bushels. (*See* also POTATOES.) (S. O. R.)

Sweet Potato Production by States, 1940 and 1939

	1940 bu.	1939 bu.		1940 bu.	1939 bu.
North Carolina	7,592,000	8,624,000	New Jersey	1,920,000	2,325,000
Georgia	6,930,000	8,892,000	Oklahoma	1,520,000	945,000
Alabama	5,850,000	8,800,000	Maryland	1,450,000	1,440,000
South Carolina	5,610,000	6,834,000	California	1,440,000	1,200,000
Louisiana	5,490,000	6,935,000	Florida	1,235,000	1,140,000
Mississippi	5,390,000	6,142,000	Missouri	1,056,000	1,105,000
Tennessee	4,800,000	3,713,000	Delaware	650,000	675,000
Texas	4,428,000	3,780,000	Illinois	560,000	528,000
Virginia	4,030,000	4,128,000	Kansas	330,000	240,000
Arkansas	3,150,000	2,680,000	Indiana	285,000	315,000
Kentucky	2,160,000	1,968,000	Iowa	255,000	270,000

Swimming. War greatly curtailed competitive swimming activities in 1940. Not only were noted stars of many countries called to service and forced to drop out of sports, but several European nations decided to cancel their annual championships, a number of customary inter-country encounters had to be abandoned and some proposed foreign tours were made impossible. Record breaking continued, however, and foremost were the amazing feats of Miss Ragnhild Hveger, of Denmark. She shattered three of her own striking world's marks, reducing the time for 400 m. free style from 5 min. 6.1 sec. to 5 min. 5 sec., 1,000 m. from 14 min. 12.3 sec. to 14 min. 9.2 sec. and 1,500 m. from 21 min. 45.7 sec. to 21 min. 10.1 sec.

Four world's standards for men were bettered in the United States. Adolph Kiefer lowered the back stroke figures for 100 yd. from 58.8 sec. to 58.1 sec. and 100 m. from 1 min. 4.8 sec. to 1 min. 4.7 sec., while varsity teams clipped free style relay marks, a Michigan four cutting that for 400 yd. from 3 min. 31.3 sec. to 3 min. 30.7 sec. and a Yale quartet that for 400 m. from 3 min. 59.2 sec. to 3 min. 54.4 sec.

Japan's swimmers, international leaders since 1932, failed to show their usual prowess. In no national title event, except the 100 m. back stroke, did they equal the winning time of 1939.

Argentina and Brazil became increasingly prominent aquatic centres, extending invitations to champions of various countries and inducing teams from the United States and Japan to participate in some of their important carnivals.

Hungary, victor in water polo at the last three Olympiads, but defeated by Germany in 1939, turned the tables in the summer of 1940 and again was acclaimed world topnotcher at the game.

The swimmers of Hawaii, who sprang so startling a surprise in outscoring all mainland teams in the national outdoor championships of the United States in 1939, not only repeated their victory, but won by a greater margin. (L. DE B. H.)

Switzerland, a confederation of west-central Europe, member of the League of Nations, bounded N. and E. by Germany, S. by Italy and W. by France. Area 15,944 sq.mi.; pop. (est. 1940) 4,200,000. Chief towns: Berne (cap. 121,976), Zürich (329,780), Basle (162,559), Geneva (123,286), Lausanne (89,632). Government: republican confederation of 22 cantons, joined together by the federal constitution of May 29, 1874, but with large powers of local control retained by each canton; central executive, a federal council of seven members; president (Jan. 1, 1941), Dr. Ernest Wetter. Languages (census 1930): German 2,924,314; French 831,100; Italian 242,034; Romansch 44,204, and others 24,797. Religion (1930): Protestant 2,230,536; Roman Catholic 1,666,317; Jews 17,973.

History.—The party composition of the national council, or lower house of the federal legislature of 187 members, was according to the elections of Oct. 1939, Government coalition: Radical Democrats 50; Catholic Conservatives 44; Farmers, Traders and Citizens 21; other parties: Liberal Democrats 6; Independents 9; Young Farmers and Free Democrats 6; Social Democrats 45; Dissident Socialists 4; no party 2. On Dec. 10, 1940, Dr. Ernest Wetter, head of the Swiss finance department and professor in Zürich, was elected president for 1941, succeeding Dr. M. Pilet-Golaz. Dr. Wetter came into the Swiss federal council in 1938 as a representative of the Radical Democrats who, even in conservative Switzerland, form one of the more conservative parties.

In view of the danger of subversive propaganda and internal agitation resulting from the European war, the Swiss took energetic precautions. On Aug. 6 the federal government prohibited all communist, Trotskyist and anarchist activity, and declared three-year prison terms and heavy fines for violations of the law. Sympathizers with national socialist Germany were much more

numerous and dangerous. The federal council on Nov. 19 decreed the dissolution of the nazi party on the ground that it disturbed public order. Seven persons charged with plotting to sabotage the country's defences were condemned to life terms.

During the first eight months of the European war Switzerland had many moments of uneasiness. It was feared that the Germans might try to reach France around the southern end of the Maginot line. But the Swiss mobilized, stood firm in their mountain defences and suffered nothing worse than the occasional flight of a nazi aeroplane across their frontier. With the French collapse in June their position became much more critical. The country was thenceforth ringed about by territory under nazi or fascist control. Its profitable tourist trade evaporated. It had to support thousands of refugees who poured across its frontiers from France, as well as some 60,000 French soldiers who sought protection under the Swiss flag and were interned for the duration.

Switzerland succeeded in preserving her neutrality and independence, but it was difficult. British planes frequently flew high over the country on their way to bomb Milan and other Italian cities, and in December dropped bombs, apparently by mistake, on Basle, killing several persons. The German and Italian press complained loudly and threateningly that the Swiss newspapers were pro-British because they printed British war communiqués.

Economic Conditions.—Swiss commerce with the outside world was almost cut off by the ring of axis territory around the country. Switzerland became more dependent on Germany for coal, iron and steel, and the raw materials for munitions. Food shortage compelled the government in October to take control over all bread grain stocks and to ration many other articles. The cost-of-living index rose in December to 156 (1914=100).

(S. B. F.)

Symphony Orchestras: *see* MUSIC.

Synthetic Products: *see* CHEMISTRY, APPLIED; COTTON; INDUSTRIAL RESEARCH; PLASTICS INDUSTRY; RAYON; RUBBER AND RUBBER MANUFACTURE; STANDARDS, NATIONAL BUREAU OF; TEXTILE INDUSTRY; GASOLINE.

Syphilis: *see* EPIDEMICS AND PUBLIC HEALTH CONTROL; MARRIAGE AND DIVORCE; MEDICINE; SELECTIVE SERVICE: *Medical Aspects;* VENEREAL DISEASES.

Syria and Lebanon: *see* FRENCH COLONIAL EMPIRE; MANDATES.

Table Tennis.

Probably no other international sport in 1940 was as handicapped by the war as was table tennis. Of the 29 countries represented in the International Table Tennis federation, 22 were involved in the conflict as belligerents or as controlled territory. Symbolic of the destruction, the federation's headquarters, Featherstone house in London, was demolished by German aerial bombs in September. For the first time since the founding of the I.T.T.F. in Berlin in 1926, there were no world championship events, the annual meeting scheduled for Paris being cancelled; and no plans were possible for 1941. Nevertheless, despite war clouds in the far east, the U.S.A. and Australia sent teams to tour Japan on invitation of Japan's association. The English championships were held, too, spectators at the finals at Wembley being restricted to 5,000 by war-time regulations and the proceeds going to the Red Cross; the men's singles title was won by world champion Richard Bergmann, Polish-Austrian. In the U.S.A., the men's title was won at Indianapolis by a hard-hitting newcomer, Louis Pagliaro, of New York, against strong foreign contenders; New York retained the national team title; the University of Pennsylvania won the Bradley trophy back from Princeton. The playing rules were unchanged, and it became apparent that the lower net (6 in. high), adopted in 1938, made the game faster. (C. Z.)

Tacoma Narrows Bridge: *see* BRIDGES; INSURANCE, MARINE.

Tactics in the European War.

The European war repeated an old paradox. No new weapons and no unique tactics were used, but Germany was able to overwhelm five nations in the most astounding series of military victories since Napoleon. Germany used the different arms available to all nations more skilfully and with better appreciation of their possibilities than her opponents. This is a not infrequent phenomenon in military history. Napoleon won his incredible campaigns by taking advantage to the full of all the new possibilities of war that had been developing in the 18th century. German superiority lay in a military organization designed and properly balanced to use modern weapons to their most effective extent, to full co-ordination of all arms, to the stamina of the German soldier resulting from an exceedingly arduous training to which he had been subjected, and to the spirit of individual initiative in which the subordinate commanders had been trained.

German tactical methods were no secret, but had been debated for years in the German military publications, had been tested in Spain and finally had been crystallized in German regulations and were available to the world. While the rest of the world was debating whether or not cavalry still was an effective agency for war, Germany had discarded its cavalry and had replaced it with large numbers of tanks organized into ten Panzer (armoured, or mechanized) divisions. While the generals of more conservative armies were discussing whether aeroplanes were of any value in the direct support of infantry operations, Germany had tested the question in Spain and found them extremely valuable. A special plane even, the Stuka dive-bomber, was developed solely for this use. While the rest of the world was deluding itself concerning the impregnability of the defensive, Germany had prepared the means and developed the methods by which defensive lines could be broken. While the rest of the world laughed at parachute and air infantry as a Russian publicity stunt, Germany was remodelling thousands of old bombers and training parachutists.

Tactics in the Polish Campaign.—In Poland the German operations commenced with what might be called the standard attack procedure of the World War of 1914–18, that is, artillery preparation and infantry advance. This continued for from three to six days with the infantry moving forward from six to ten miles a day. When the Polish resistance had become weakened, the Panzer divisions, which had been brought up secretly at night, were rushed through the soft points to the rear of the Polish armies. The German armoured divisions were behind the second Polish defensive line before the Poles themselves could withdraw to it. After this they were never stopped nor headed, but continued their work of disorganization and demoralization in the Polish rear. The German infantry followed by forced marches of from 20 to 30 miles a day and surrounded the Polish armies at various localities and finally forced their surrender.

German aerial tactics in Poland in the first phase, which lasted about five days, were devoted to destroying the Polish air force and its aerodromes and to the destruction of the Polish aeroplane and armaments factories. When the German air force had gained complete control of the air, aerial attacks then were turned against the Polish railroads and marching columns of Polish troops. The destruction of railroads and the bombing of every unit found marching on the roads prevented Polish reserve formations from ever reaching the front and blocked the rearward movement of the Polish armies to new defensive positions. At the same time, aviation was used to destroy the Polish command system, and this was done so effectively that shortly they were

GERMAN PARACHUTE TROOPS were effective military and psychological factors in the 1940 conquests of the Low Countries and France. Here one is shown disengaging his chute after landing

leaderless and out of touch with those who should have co-ordinated the fighting.

When the battle lines became fluid and warfare reached the manoeuvre phase in the open, German organization of their infantry regiments as self-contained combat units equipped with their own artillery, and with divisional artillery and engineers attached, proved itself. The German regiments advanced independently without waiting for orders until they, too, were far behind the Polish armies, and the Polish soldiers, although fighting bravely, had to surrender when encircled.

Poland supplied an answer to a much debated military question, namely, the relative value of cavalry and tanks. The Polish army had maintained 40 regiments of cavalry, and had contended that on the open plains of Poland was to be found the ideal ground for cavalry operations. Against tanks and well-armed infantry, cavalry proved powerless. The horse could not dig itself into the ground to avoid machine gun fire, nor could it run fast enough or far enough to get away from the tanks. One even heard of Polish cavalry charging with lances against tanks.

Norway.—The most vital conclusion of the European war can be drawn from aerial operations in Norway. The British were able to land troops in harbours not occupied by the Germans initially, while the German air force was in Norway in small numbers, and was operating primarily in direct support of soldiers fighting in the Norwegian valleys. When German air power was turned against British landings and the efforts of the British to supply and reinforce the troops already in Norway, it was able to prevent any further reinforcement and to make the position of the British expeditionary force so precarious that it had to be withdrawn. This supplies one of the most important tactical lessons in all the history of warfare: *a continental nation properly armed has become impregnable to invasion across the sea.*

The Campaign Against France and the Low Countries.—In Holland parachute troops attempted to capture Rotterdam and The Hague, as well as several landing fields. The great Moerdijk bridge across the Maas river was captured and held by parachutists who later were reinforced by air infantry, which was disembarked from flying boats which landed in the river. In the campaign of Belgium and France, parachute troops were dropped in smaller numbers primarily for disorganization, cutting of telephone lines, to spread panic and to send information of enemy troop dispositions.

Whereas in Poland, Holland and Belgium the initial attacks were launched by infantry supported by artillery, with the armoured divisions held back until defensive lines had been broken, in the break-through across the Meuse from Belgium into France the initial attack was launched by armoured divisions, and dive-bombers substituted for artillery in preparation for the assault. The advance of the mechanized divisions had been too fast for the infantry and artillery to keep up with them. It is not probable that initial attack by tank formations will become standard procedure, but the crossing of the Meuse shows that where the attack can be launched with surprise, aviation and mechanized forces have sufficient power to overcome very strong resistance.

The Maginot line was not captured by frontal attack. It was surrounded and captured from the rear. Although certain superficial conclusions may be drawn about the weakness of fortified lines, there is no reason to believe that a properly constructed fortified line of sufficient depth will not be able to withstand the heaviest of attacks for long periods of time. The French extension of the Maginot line, the so-called Little Maginot line running along the Belgian frontier from Luxembourg to the English channel, was only lightly fortified, and its breach proves nothing with reference to the heavily fortified lines constructed in time of peace. (*See* also ARMIES OF THE WORLD; EUROPEAN WAR.) (T. R. PH.)

Tahiti: *see* PACIFIC ISLANDS, FRENCH.

Tainter, Charles Sumner (1854–1940), U.S. inventor, was born in Watertown, Mass., April 25 and was educated in the public schools. While working as an instrument maker in Boston he became associated with Alexander Graham Bell, inventor of the telephone. The two went to Washington and organized the Volta Laboratory association where Tainter's work is said to have made phonographs commercially possible. He was the inventor of the dictograph and the hard rubber disk for the phonograph. He received a gold medal at the Paris exposition in 1881 for inventions in connection with the radiophone and in 1889 he was made an officer of public instruction by the French government, in recognition of his invention of the graphophone. He died in San Diego, Calif., April 20.

Taiwan: *see* FORMOSA.

Tajik S. S. R.: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Talc. The United States talc output, which now exceeds 200,000 metric tons annually, comprises more than half of the world total; French production was formerly in excess of 80,000 tons, but during recent years has declined about one-quarter; Manchoukuo has been increasing, and now ranks ahead of France; the next producer in size is Italy, with more than 50,000 tons; Austria, Canada, China, India and Norway have outputs between 10,000 and 25,000 tons, and outputs of a number of other countries are smaller. Previous German production, mostly from Bavaria, supplied only 20–30% of the requirements, but the addition of the Austrian output will raise the total almost to self-sufficiency. Talc occurs in a wide variety of forms and grades, each of which has its own industrial uses, with the result that most countries, even those with the largest outputs, need to import some grades.

The United States produced 254,000 short tons in 1939, with net imports of 17,000 tons. This was used in paint 27%; ceramics 15%; roofing, paper and rubber each 12%, leaving 22% for a large number of minor uses. Canadian production in 1939 was 13,100 tons. (G. A. RO.)

Tanganyika: *see* BRITISH EAST AFRICA; MANDATES.

Tangier. Before developments arising out of the European war Tangier, one of the zones of Morocco, was an international territory, neutralized and demilitarized, under the nominal sovereignty of the Sultan of Morocco with France as the paramount power. Following the entry of Italy into the war and the collapse of France, Tangier was "provisionally" occupied by Spanish Khalifian troops (June 14) with, it was reported, the concurrence of the French government, and with the declared intention of guaranteeing its neutrality and the affirmation of the Spanish foreign office that the international administration would be maintained and the rights of interested powers respected. On Nov. 4 the Spanish military commander, Colonel Yuste, deposed the French administrator (M. Le Fur), abolished the assembly and the international institutions, and proclaimed himself governor as a first step to the eventual annexation of the territory to Spain. Area 225 sq.mi.; pop. (est. Dec. 31, 1938) 60,000. Chief town (cap.) Tangier (pop. 45,000). Languages, official, Arabic, French and Spanish; religion: mainly Mohammedan. Trade, external (1938) imports, 94,693,830 fr.; exports, 11,380,286 fr. Finance: (est. 1939) revenue, 29,795,500 fr.; expenditure, 29,653,312 fr.; public debt, 9,566,548 fr. In 1940 there were 65 mi. of roads suitable for traffic and the port was in course of modernization. The French mantained a radio station in the capital, where also was a telephone service.

Tanks: *see* ARMIES OF THE WORLD; LIGHTNING WAR; MUNITIONS OF WAR; TACTICS IN THE EUROPEAN WAR; EUROPEAN WAR.

Tariffs. In the field of tariffs and commercial policies the year 1940 was marked by continued increase in the dominance of trade and exchange controls, by the elimination of several customs frontiers and by continued tinkering with tariffs which in each country are maintained as the substructure of trade control.

With the outbreak of the war in Europe in Sept. 1939 nearly every government in Europe, except those of Germany and Italy, took more or less drastic measures to restrict some or all exports or imports or both, directly or by exchange control. German and Italian trade policy was least affected as these states had long been organized as war economies. Britain and France and their empires took long strides in the direction of complete state control of trade. Led by Britain and the dominions, by the end of 1940 the British empire had gone far towards eliminating trade that did not directly contribute to the war effort. But if one is struck by the steady extension of war's restrictive effect on trade, one is also struck, in reviewing the measures, by the reluctance and slowness with which that restriction has been accepted. Throughout the empire many of the restrictive measures were, incidentally, protectionist and discriminatory against countries outside of the empire. The latter half of the year, however, saw numerous trade restrictions extended at least nominally to empire products previously exempt, and consumption of locally-produced nonessentials was being reduced by sales taxes and other devices.

At the outbreak of the war some of the Latin-American countries also passed sweeping emergency measures giving almost unlimited economic control to the executive.

In general 1940 witnessed only the increase and tightening of previous measures of control by belligerents and neutrals alike. Japan, already at war for two and one-half years, found several further ways in which to exercise state control of trade.

The characteristic war measure is the licence system, generally applied by belligerents first to imports but increasingly to exports. By June 1940 the United Kingdom had made all imports except live quadrupeds subject to licence (including, however, some for which open general licences were granted). In September France made 12,000 items subject to export licences. Neutral countries also, including the United States, have increasingly subjected exports to licence requirements and even embargoes, though on a small scale compared to what the belligerents have done. The licensing systems of neutrals may operate either to retain within the country products considered necessary for armament and industrial development or to give the government a stronger position in bargaining with belligerents. In November Greece, which formerly controlled imports chiefly by a quota system, made all imports subject to special licences.

In the spring several Balkan states, in June Spain, and in September Yugoslavia, Finland and Spanish Morocco installed central agencies to exercise or supervise all trade controls, with more or less complete control over all trade. Sweden introduced official exchange control in February, Switzerland introduced unofficial exchange control in May, in June Ecuador reintroduced the system which had been abolished in 1937, and Venezuela strengthened its system in October. Effective Nov. 14, the legislature of Ecuador gave to the president and council practically unlimited power to take emergency economic measures.

Bilateral trade balancing continued to spread. Countries within the British blockade went over to bilateral trade balancing almost entirely, though in the latter part of the year among countries within the zone of German conquest or of military and economic pressure, there was initiated a new series of clearing agreements looking toward the development of multilateral balancing of trade through a central office in Berlin to supersede numerous bilateral clearing agreements. The war accelerated the trend in Europe toward the monopolization of foreign trade under compulsory business associations or governmental boards.

The United States took a further step toward international economic planning in the agreement signed on Nov. 28 by the United States and 14 coffee-producing countries of the western hemisphere. Its purpose was to limit and control the marketing of their coffees in the United States and elsewhere.

As usual, most of the world's 100,000 tariff rates remained stable through the year, though the total number of changes in duties may easily have run into the thousands. Bolivia alone made a general tariff revision, mostly technical. In the British empire there were widespread increases of duties ostensibly at least for raising revenue or for lessening nonessential imports. The United Kingdom imposed a third increment of 2*s.* a pound on tobacco, bringing the total to 15*s.* ($3.00) per pound. India imposed 3% ad valorem on articles previously free. Canada and New Zealand raised the sales tax in June to 10% ad valorem, as Australia did in November. Canada exempts products of the empire and on imports from nonempire sources the Australian and New Zealand rates are roughly twice 10%, being 10% on duty-paid values plus 20% and 25%, respectively. Newfoundland waited until Dec. 1 to impose a war revenue tax of $7\frac{1}{2}$% ad valorem on almost all imports from Canada, Hongkong and nonempire areas. In October the United Kingdom levied luxury taxes of $33\frac{1}{3}$% or $16\frac{2}{3}$% ad valorem on long lists of luxuries and other products, domestic or imported—levied on imports (as far as imports were still permitted) on the duty-paid value. Early in December, Canada made important additions to the list of products prohibited except from empire sources, including cereal foods, automobiles, furniture, silk fabrics, clothing and toys; removed or reduced duties on numerous British products; announced products to be licensed on a decreasing scale, including tobacco and raw silk; and imposed excise taxes of 20% or 25% on domestic production of some of the articles whose importation was restricted.

On the other hand, the world saw numerous decreases of duties as goods became scarce and prices rose. Several reductions or exemptions were made by the belligerents but more were made by neutrals either to ease the cost of living or, as in Uruguay and Venezuela, to reduce costs of raw materials or semimanufactures as aids to domestic manufacture; but in no country do such reductions seem to have been of great significance. In October Argentina generalized to all countries reductions made in agreements with Chile of June 1933 and Feb. 1940. Colombia extended to Argentina the reductions made to the United States in 1935. Salvador extended its minimum tariff rates to several more Latin-American states. Of great significance, if its principles are carried out on a large scale, was the agreement signed on Oct. 6, 1940, by the ministers of finance of Argentina and Brazil. They contemplated a development of complementary rather than competitive economies in their huge countries, agreeing in principle that new industries not now established in either country shall, when established, have free access to the markets of both countries, that the same objective shall be sought for industries now established in only one of the countries and for minor industries, that reduction or elimination of all duties shall be pursued as far as can be done without disturbing present production; and that similar agreements shall be made with other Latin-American countries.

Tariff barriers disappeared between Italy and Albania with the customs union of March 1940. Germany absorbed—as she had already absorbed Austria, Sudetenland, Memel and western Poland—Danzig (January), Luxembourg (August) and Bohemia and Moravia (October). In October and November the German exchange control law was extended to Lorraine and to Alsace, and the exchange barriers between them and Germany were abolished. On Dec. 16 abolition of the German customs frontier against the Netherlands was announced. The soviet union absorbed eastern Poland, the Baltic states and Bessarabia. The removal or shifting of these numerous customs frontiers in one sense extends areas of "free trade"; but the subjection of additional territories to totalitarian regimentation can scarcely be regarded as a freeing of trade.

In contrast, the Philippine islands were preparing for an independent economy. On Jan. 1, 1941, products which had benefited from free entry into the United States became subject to Philippine export duties equal to 5% of the United States import duties on similar products of other origins. (*See* also TRADE AGREEMENTS.) (B. B. W.)

Tasmania, a state of the Australian commonwealth, forming an island 26,215 sq.mi. in area to the southeast of the mainland, from which it is separated by 140 mi. of Bass strait. The state governor is Sir Ernest Clark K.C.B. Population (est. Dec. 1939) 241,576. Chief towns: Hobart (cap., 65,450); Launceston (33,250).

History.—R. Cosgrove's government remained in office throughout the year 1940. State finances resulted in a balanced budget for 1939–40 compared with an estimated deficit of £58,000. No new taxes were introduced but the Land and Income Tax act was amended to abolish the wages tax and to adjust certain concessions in the income tax and special tax which would provide for a similar total amount of tax to be collected. Taxes were in future to be collected by compulsory instalments.

Agricultural and pastoral conditions were satisfactory and industrial development continued. After many years of careful planning the newsprint industry became an accomplished fact when the first unit of the mill at Boyer came into production. Its present capacity (1940) is 23,000 tons of newsprint a year.

J. Morris was appointed chief justice of the supreme court in succession to Sir Harold Crisp. He was 37 years of age and was the youngest chief justice in Australia.

Finance.—Revenue (1939–40), £A3,055,000; expenditure £A3,053,000; public debt (June 30, 1939), £A26,366,990.

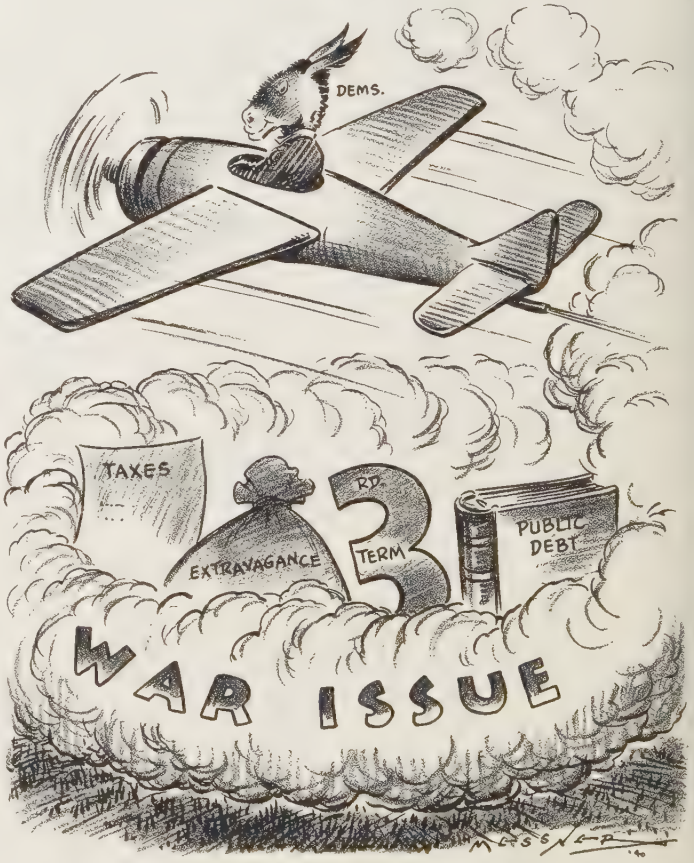
Communication.—Dec. 31, 1939: roads, surfaced *c.* 21,000 mi.; railways: government 658 mi.; private 132 mi. Motor vehicles licensed (Dec. 31, 1939): cars 17,705; trucks 5,100; cycles 3,549. Wireless receiving set licences (Dec. 31, 1939) 40,713. Telephones (June 30, 1939) 18,013.

Industries.—Production 1938–39: primary £A8,142,441; secondary £A5,398,659. Labour, 1938–39 average: factory employment 13,802 employees; unemployment (trade union returns) 7·1%. (W. D. MA.)

Taussig, Frank William (1859–1940), U.S. educator, emeritus professor of political economy in Harvard university, was born in St. Louis, Mo., Dec. 28 and died in Cambridge, Mass., Nov. 11. For a biographical sketch see *Encyclopædia Britannica,* vol. 21, p. 836.

Taxation. Through resort to so-called "hidden taxes," state and federal governments had been able to raise many millions of dollars in revenue each year in the United States without seriously disturbing the complacency of the payers of such taxes. Evidence of this fact was established in the results of a nationally conducted poll by a recognized authority on the testing of public opinion. The poll revealed that 25% of the people believed that they paid no taxes.

But in 1940, feverish preparations for national defence in the United States, with congressional appropriations and authorizations for future expenditures aggregating approximately $20,000,000,000, compelled the nation to face up to a situation that it



TAXES and federal spending were neatly beclouded as campaign issues in 1940, according to Messner of the *Rochester Times-Union* in his cartoon, "Smoke Screen"

had chosen to ignore for almost a decade. Revenues of the treasury would have to be substantially increased. All hope of bringing the federal budget into balance—or anything approaching a balance—through reduction of governmental expenditures vanished with the development of the defence emergency.

The first effect of the fiscal emergency was the breaking down of the last resistance in congress to a broadening of the base of the federal income tax structure. In the first revenue act of 1940, effective June 25, exemptions on individual incomes were lowered —for married persons, from $2,500 to $2,000; and for single persons, from $1,000 to $800. Thus, more than 2,000,000 persons were added to the number of income taxpayers.

An innovation in the U.S. tax system was introduced through an emergency provision of the first revenue act of 1940, establishing a "supertax" to offset in part the national defence preparedness expenditures of the ensuing five years. This "defence tax," which will expire as of Dec. 31, 1944 (unless renewed by congress), will increase by 10% the amount of annual income tax that otherwise would have been paid by each income taxpayer.

No change was made in the normal tax rate of 4%, but surtaxes were increased in the "middle brackets." Higher corporate levies were provided and also excise (so-called "nuisance") taxes were increased on such items as automobiles and accessories, insurance policies, admissions, gasoline and oils, cigarettes, beer and distilled spirits.

The purpose of the second revenue act of 1940 (approved Oct. 8), known as the excess profits tax, was twofold: (1) to produce new revenues; and (2) to avert a crop of "war industry millionaires" in the United States. The repercussions of this highly complicated and almost incomprehensible law were immediately felt in American industrial and investment circles. The uncertainties regarding its application were more disconcerting to business than the severity of its tax provisions.

In addition to excess profits taxes, the law imposes on certain classes of corporations earning more than $25,000 a year an additional increase of 3·1% in their normal income tax, bringing their normal tax up to 24%. But in the case of corporations whose normal-tax net income is slightly in excess of $25,000, and which are entitled to use the "alternative tax," the full 3·1% increase in normal tax is not applicable until the normal-tax net income reaches $38,565.89. An exemption of $5,000 is provided.

Corporations are given the choice of two methods of computing their excess profits, one based on invested capital for the year in which the tax is levied and the other on average earnings for the years 1936 to 1939 inclusive. The tax rate is graduated from 25% on the first $20,000 excess profits to 50% on all excess profits over $500,000.

The revenue provisions in both acts of 1940 were retroactive to the first of the year. They were admittedly only "stopgap" measures and undoubtedly will undergo radical revision in tax legislation to be undertaken by the 77th congress. The 1940 acts are expected to produce between $1,500,000,000 and $2,000,000,000 new revenue annually. Nevertheless, the year 1940 closed with the prospect that all revenues received by the federal treasury would equal not more than one-half of current government expenditures.

One major tax development in 1940 was the issuance by the treasury of $500,000,000 fully taxable five-year notes at the low interest rate of $\frac{3}{4}$ of 1%. This action was taken as the first direct step toward removal of tax exemption from all future federal bonds, and possibly state bonds as well, the latter a highly controversial subject.

Federal, state and local tax collections in the United States for the fiscal year 1940 were estimated by the National Industrial Conference board at approximately $14,354,000,000, of which $5,568,000,000 was federal, $4,086,000,000 was state and $4,700,000,000 was local. (*See* also SUPREME COURT OF THE UNITED STATES.)

Great Britain.—The end of the year 1940 found Great Britain bearing up under the most crushing tax burden in its history. Heavy increases were made during the year in the taxes imposed upon individuals and corporations. Finance Act. No. 2 of August 22 fixed the standard (normal) income tax rate for the year 1940–41 at 8*s*.6*d*., or 42½%, which rate supersedes the 7*s*.6*d*., or 37½%, rate which had been established for 1940–41 by two previous acts.

Personal allowances (exemptions) for individuals remained unchanged at £100 for a single person, £170 for a married couple and £50 for each child. The first £150 of taxable income is taxed at 5*s*., or 25%.

The excess profits tax rate is increased from 60% to 100%: that is, Britain confiscates all corporate earnings deemed to be in excess of "normal." Other new revenue measures include a purchase tax of 33⅓% of wholesale value on luxury goods and 24% on necessities. The maximum rate of death taxes has been boosted to 60% on the largest estates. There are numerous other new and increased consumer taxes.

Canada.—In addition to drastic modifications of income tax rates and excess profits taxes, Canada on June 1, 1940, inaugurated a national defence tax at a flat rate on total net income. The rate is 2% for married persons whose income exceeds $2,000 a year. In the case of single persons the rate is 2% on incomes between $600 and $1,200, and 3% if annual income exceeds $1,200. Employers are required to deduct this tax from employees' earnings. The new excess profits tax rate is increased from 50% to 75% on the excess over "standard" profits (average profits for 1936–39 inclusive). The individual income tax base was broadened by reducing exemptions.

Australia.—On Nov. 21, 1940, the commonwealth imposed new taxes on an unprecedented scale, the third major assessment act of the year. The range of the income tax was extended and the graduated rates sharply increased. With state taxes also heavy, Australia will devote 20% of national income to the war effort. The increased income is set to yield £26,000,000, compared to the £10,000,000 tax imposed under Act No. 18 of May 27, 1940.

Corresponding tax increases were made by New Zealand and by the Union of South Africa.

Germany.—Only minor changes were made in 1940 in German taxation. The war economic decree of Sept. 4, 1939, established a war surtax of 50% of the normal income tax on incomes in excess of 2,400 marks, but this surtax is not to exceed 15% of total income, and the income tax plus surtax is not to exceed 65% of total income. A decree issued Nov. 7, 1940, exempts from income tax all extra payments to workers for overtime and for Sunday, holiday and night work. In December, obviously to induce more Germans and German businesses to move to the former Polish territories now incorporated into the reich, nazi authorities drastically reduced the taxes payable in those districts.

U.S.S.R.—Income taxes are collected monthly by the soviet union and the graduated rates cover a wide range, depending upon the occupation or profession of the taxpayer. Exempted as to their income from work are all Heroes of Labour and citizens decorated with orders or honours, but any income from other sources in excess of 6,000 rubles a year is taxed. New taxes for housing and cultural construction also were imposed. (*See* also INCOME TAX; INITIATIVE AND REFERENDUM; LEGISLATION.)

(C. A. SR.)

Taylor, David Watson (1864–1940), U.S. naval officer, was born in Louisa county, Va., March 4, and was educated at Randolph-Macon college and the United States Naval academy, graduating from the latter in 1885 with the highest standing attained by any student up to that time. He was sent to the Royal Naval college in England from which he was graduated in 1888, again with the highest honours on record. He achieved the rank of captain in 1901 and was made a rear admiral in 1917. He was chief constructor of the U.S. navy and head of the bureau of construction and repair from 1914 to 1922. He retired in 1923 and died in Washington, July 28.

Tea. The world consumption of tea increased substantially in 1940 despite rationing in the United Kingdom and other wartime restrictions. For the year April 1, 1939, to March 31,

Tea Imports Examined by U.S. Food and Drug Administration, 1940

	Passed lb.	Rejected lb.		Passed lb.	Rejected lb.
Black Teas			*Green Teas—cont'd*		
Ceylon	24,218,306	1,561	Ping Suey green	1,615,226	..
India	19,903,592	718	Country green	130,296	..
Blended C. & I.	292,558	..	*Oolong Teas*		
Java	19,901,753	715	Formosa oolong	4,530,942	52,500
Sumatra	9,633,871	288	Canton oolong	288,247	36,935
Formosa black	4,459,378	..	Scented Canton	308,585	4,930
Japan black	705,660	.	Pouchong	11,285	..
Congou	2,500,105	70,418	*Mixed Teas*		
Tabloid	327		Scented teas (Jasmine, Lichee and Rose)	110,732	60
Lapseng Souchong	17,802	..	Scented Orange Pekoe	1,806	..
Ceylon-India-Sumatra	36,661	..	China Flowery Pekoe	6,703	..
African	184,855	..	Green and Black Japan	16,692	..
India-Ceylon-Java-Kenya	30,200	..	Other mixtures	7,566	..
Green Teas					
Japan	10,939,908	1,220			
Japan dust	2,253,567	.			
Japan gunpowder	380,545	.			

1940, the International Tea committee announced total exports of 932,100,000 lb. compared to 926,500,000 lb. in the preceding months of 1938–39, and 874,100,000 lb. in 1937–38, and 833,500,000 lb. in 1936–37. Of the 1939–40 exports, 80% was from India, Ceylon and the Netherlands East Indies, and 2½% was from British East Africa, all areas conforming to quota regulations of the International Tea committee. The remaining 17½% was from countries not subscribing to regulations, chiefly China, Formosa and Japan. Extensive advertising by the tea industry is reported to have increased tea consumption in the United States in the last six years. United States imports for the five years 1935–39 averaged 87,231,000 lb., valued at $18,818,000, with yearly per capita consumption at 0·68 lb. Imports in the United States in the calendar year 1940 were 97,791,000 lb., valued at $21,090,000, and per capita consumption was 0·74 lb. For the first ten months of 1940, United States imports of tea were 80,213,982 lb., valued at $18,583,178. Of the United States' 1940 imports slightly more than 1,000,000 lb. were from the United Kingdom, where tea was rationed to 2 oz. per person per week and where restrictions reduced yearly per capita consumption from about 9½ lb. to 6½ lb. The amount of tea imports examined by the United States Food and Drug administration in the fiscal year ending June 30, 1940, was 102,662,503 lb., of which 169,345 lb. were rejected. In the preceding fiscal year 88,027,924 lb. were examined under provisions of the Federal Tea act. The table shows varieties and quantities of tea examined and passed or rejected by the United States in the fiscal year ending in 1940.

(S. O. R.)

Technical Training: *see* EDUCATION, VOCATIONAL.
Technicolor: *see* MOTION PICTURES; PHOTOGRAPHY.

Telegraphy. The year 1940 witnessed a continuation of the gradual transition of the telegraph industry to automatic time and cost saving methods and toward increased speed and accuracy which has been noticeable in recent years.

Maximum Usage of Trunk Lines, which in recent years has been greatly advanced by use, among other means, of the varioplex, was accelerated during 1940 by a considerable expansion of varioplex usage. The number of such systems and the patrons served thereby showed a substantial increase.

Reperforator Switching, already so successfully applied to the automatic passing of business through relay telegraph offices, was being further applied and was also coming more and more into favour with large users of the telegraph who operate their own private wire systems. A number of these automatic relaying installations were in use by important institutions.

Subcentre Switching, a means by which a group of patrons, or small offices, each having a private line to a central point may be automatically connected, over a limited number of trunks, with a main telegraph office or with distant points for the direct transmission of business in either direction, was still further developed and utilized.

Frequency Modulation, much publicized for radio broadcasting, where higher quality channels are obtained by its use, was successfully applied to carrier telegraphy, providing an important increase in reliability without reducing the total capacity or number of channels in the carrier system to which it is applied.

Facsimile Telegraphy, in its various applications, continued to advance in perfection of devices and in usage. This method of transmission is now used in the automatic telegraph, enabling a patron to deposit his telegram in a slot machine by which the message is automatically transmitted to a central telegraph office, between branch and main telegraph offices and between distant cities. The facsimile transmission of matter and its reproduction in stencil or other master copy form, permitting many reproductions at a distant point, reached higher stages of development and sending and recording machines performing these functions can now be located hundreds of miles apart. Where different sources of power are used the synchronous operation of the motors driving these machines is assured by the use of electrically driven tuning forks.

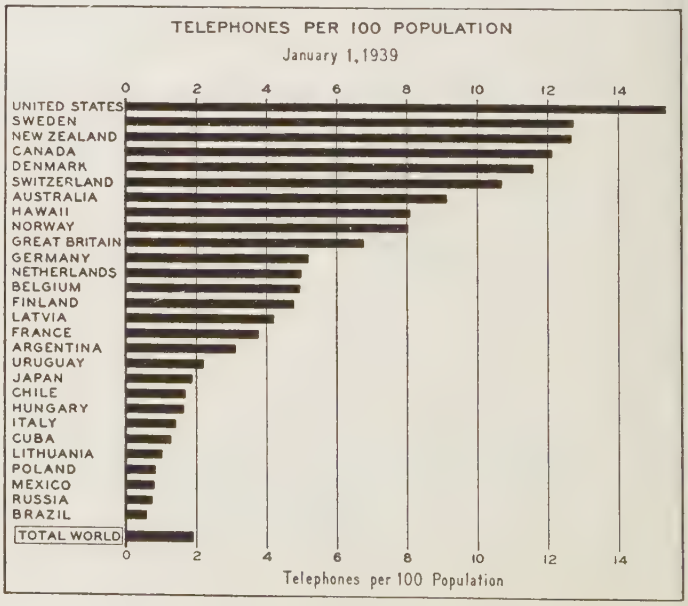
Rubber Insulators, quite often used in the early days of the telegraph, but later replaced almost entirely by glass and porcelain because of the better insulating properties of the latter materials, were improved to such a degree that they were frequently used in locations where considerable breakage was encountered.

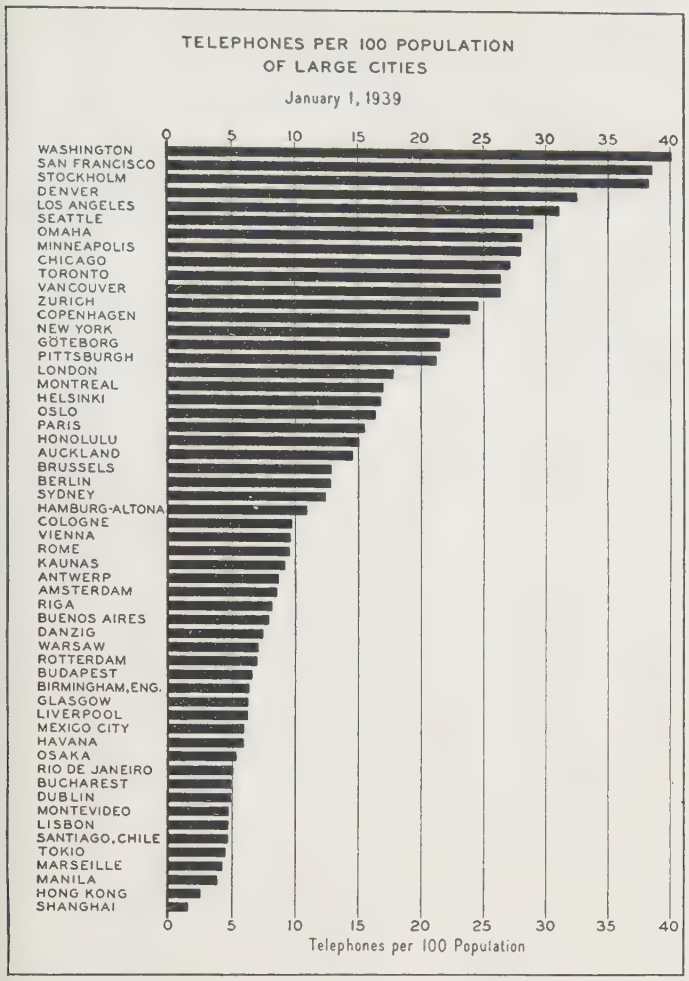
(R. B. W.)

Telepathy: *see* PSYCHICAL RESEARCH.

Telephone. The number of telephones in service in the United States is expected to show an increase for 1940 of more than 1,000,000 and will thereby reach a new high level. To meet the increased traffic resulting from the faster tempo of business, about 500,000 circuit miles were added in 1940, for long-haul toll service. About two-thirds of this mileage was provided by voice-frequency facilities and the older types of carrier systems, while one-third was added by means of the so-called broad band carrier system for open-wire and cable.

Toll Cable.—By the end of 1940 more than 70% of all long-haul circuits had the stability afforded by protection in impervious lead sheath. Plans completed called for the westward extension





of the cable network from Omaha, Neb., and by the end of 1941 twin cables from Omaha to Denver, Colo., will be ready for service. Part of this line will be placed in conduit, but for most of the 600 mi. distance the cables will be buried by a special plow perfected during 1940. The plow buries both cables at once, one above the other.

Another important cable was installed between Baltimore, Md., and Washington, D.C. This runs underground along a route entirely different from that followed by all of the direct cables previously in service between the two cities. Another cable project (advanced two years ahead of schedule for reasons of national defence) is the twin-cable installation between Richmond and Norfolk, Va. Moreover, in the 112-mile section of the transcontinental line between Amarillo, Tex., and Tucumcari, N.M., snow and ice on the open-wire lines at times interrupted transmission. Two small cables arranged for carrier operation were therefore placed in this section.

Coaxial Cables.—The first commercial installation of coaxial cables between Minneapolis, Minn., and Stevens Point, Wis., a distance of about 200 mi., was completed and regularly handled traffic. During the severe storm emergency in the northwest in November, a number of the coaxial circuits were useful in replacing damaged circuits on other routes. The full capacity of the cable for 480 circuits will not be utilized for some years.

Dial Service.—The number of dial telephones in service in the Bell system increased by about 1,250,000 in 1940, so that approximately 62% of telephones were dial-operated. About 220,000 lines of crossbar dial central office equipment were installed, and some 350,000 were in 1940 served by crossbar equipment.

Further progress was also made in 1940 in applying methods whereby toll operators may dial directly the number of a telephone in a distant community. For example, on a call from New York city to a town in Ohio which is connected to Columbus, O., by a dial intertoll trunk, the Columbus operator upon receiving the call can dial directly the desired number in the distant town instead of relaying the call to the local operator there. The Ohio toll dial network is at present the largest in the country, comprising some 265 dial intertoll trunks and permitting toll calls up to about 200 mi. to be dialed by the operator.

During 1940 about 14% of all toll messages were handled in this way.

Radio Telephone Services.—By the end of 1940 overseas service to Belgium, France, Gibraltar, Greece, Luxembourg and the Netherlands was suspended because of the war. Although transatlantic traffic fell off, calls to South America, Hawaii and Australia gradually increased, so that the total volume of overseas traffic was nearly as great as it was before the war. Facilities for additional circuits to South America were being built and facilities to the Caribbean countries improved.

In the matter of coastal and harbour radio telephone service, over 2,500 vessels were equipped in 1940 for communication with any land telephone. At the close of 1940 there were 14 radio telephone transmitting and receiving stations serving the waters of the Atlantic, Pacific and Gulf coasts. In addition, in 1940 there were six non-Bell stations serving the Great Lakes and other inland waterways.

The year 1939 inaugurated a service in New York city and Chicago, Ill., whereby telephone customers may obtain the latest weather information and forecasts by calling or dialing WEather 6-1212 in New York and WEAther 1212 in Chicago. The reports are recorded upon endless magnetic tape and the equipment is so designed as to transmit at the proper sound level to as many customers as may be simultaneously connected to the bureau. For the tape a new magnetic alloy called "vicalloy" is used. Vicalloy can be made to hold more permanent magnetism than any commercial material. In 1940 the service was offered in Baltimore; Washington, D.C.; Detroit, Mich., and Boston, Mass.

BIBLIOGRAPHY.—*Bell System Technical Journal; Bell Telephone Quarterly; Telephony; The Post Office Electrical Engineers' Journal* (British); *Annales des Postes, Telegraphes et Telephones; Europaischer Fernsprechdienst.* (W. S. G.)

Telescopes. Interruptions to normal scientific research occasioned by the war resulted in the planning of but very few important telescopes outside of the United States in 1940. Of those under construction the progress may be summarized as follows:

200-in. Reflecting Telescope (F 3·3) of the California Institute of Technology. Major portions of the mounting were erected and tested on Mt. Palomar and much of the driving mechanism was completed. Optical figuring of the 200-in. mirror was in progress. A small amount of residual astigmatism is now being removed and a slight bending of the disk in the vertical position is being corrected by the addition of compensating levers to the support system.

74-in. Reflecting Telescope (F 4.9) of the Radcliffe observatory. Dome and mounting were erected at Pretoria, South Africa, but completion of mirror in England was delayed by war conditions.

48-in. Schmidt Telescope (F 2.5) of the California Institute of Technology. Spherical Mirror, 72 in. in diameter, was completed and figuring of 48-in. correcting plate was in progress. Dome on Mt. Palomar was erected and mounting under construction.

24-in. Schmidt Telescope (F 2.5) of the Harvard college observatory. Optical parts consist of a 33-in. spherical mirror and a 24-in. correcting plate. Instrument was essentially completed and erected at the Oak Ridge station.

21-in. Photographic Refracting Telescope (F 7) of the Lick observatory of the University of California. Mounting was finished and erected on Mt. Hamilton and optical figuring of lens was completed

In addition a plan was under way for converting the 60-in. reflector of the Harvard college observatory in South Africa into a telescope of the Schmidt type.

Two instruments planned for photographing the solar corona in full sunlight are the coronagraph of the Lyot type built by the Harvard college observatory to be used at a mountain site in Colorado and the scanning device developed by Skellett at the laboratories of the American Telephone com-

pany, under erection at the McDonald observatory in Texas.

The deposition of fluoride coatings upon the surfaces of lenses and prisms to reduce losses by reflection has resulted in a marked gain in the light-efficiency of all auxiliary instruments used with telescopes, being especially effective in stellar spectrographs. (*See* also ASTRONOMY.) (W. S. AD.)

Television. Technical advances in television for the year 1940, so far as they are generally known, appeared largely to have been limited to work carried on in the United States. Wartime activities in Britain and Germany, which nations formerly were also centres of television development, seemed to have put an end to television research there, although it was rumoured that the application of television to specific military requirements was at least being studied. No one can deny that television would be a strategic tool of outstanding value if it were capable of transmitting the maximum detail that is now obtainable in the photographic sciences. If a plane flying at 20,000 ft. could transmit, to the base station, a motion picture that would locate and identify machine-gun nests, or even supply centres, the result should be useful in a military sense. But it happens that television was in 1940 less exact than the highly developed "still" photograph; this same lack of ultimate detail was also characteristic of the motion picture, and it seems reasonable to conclude that until the military authorities find a utility in the ability of television to show scenes in motion, there will be little opportunity for either television or the movies to compete with the camera in a military sense.

But the situation in 1940 with respect to the home broadcasting of television was different. While all who are familiar with the field might puzzle as to just what military applications might be important, there was little or no difference of opinion as to the fact that television has merit as a home broadcast service. The addition of sight to sound, via the radio, is qualitatively comparable to the addition of sound to sight in the motion pictures of some years ago. The experimental television operations, particularly in the U.S.A., England and Germany, have proved that in certain types of program the provision of both visual and aural interpretation has immensely increased the value of the program in terms of observer interest and satisfaction.

Television in the U.S.A. appeared to have started off, early in 1940, under conditions which would have made it at least partially self-supporting by reason of the contributions of advertisers to the cost of producing television programs. A number of receiving set manufacturers were offering television receivers for sale to the public, and a number of television broadcasting stations were planning (and in some instances producing) regularly scheduled programs of entertainment and information for home reception. However, there arose a difference of views as to standards and the need for flexibility in future development, and this resulted in Federal Communications commission actions which postponed such development of the television services on a business basis until the channels theretofore assigned to television could be rearranged to accommodate the newly developed frequency modulation type of sound broadcasting and until there was obtained further evidence of a substantially unanimous industry agreement as to the way in which television should be presented to the public.

On the first of these two points the Federal Communications commission reassigned television stations using the lowest television frequencies to a channel some six megacycles higher. This necessitated a close-down for the stations concerned, in order to permit the required changes in transmitting apparatus and antennas, but the alterations were completed in time to permit resumption of limited program service during the fall months. Television was thus able to serve the public by transmitting scenes from political meetings during the presidential campaign of 1940, including a sight-and-sound presentation of Wendell Willkie from Madison Square Garden, New York city, just before election day.

As to the second point, a plan intended to provide for industry agreement on standards for television was put into effect by the formation of the National Television Systems committee, as sponsored jointly by the Federal Communications commission and the Radio Manufacturers' association. This committee brought together all interests concerned with the development of television in the U.S.A., and it was anticipated that their joint findings would be presented to the Federal Communications commission early in 1941. The desired result was to stimulate the public adoption of television as a home broadcasting service, under a set of regulations that would encourage its extension and at the same time remove the possible dangers of early obsolescence that had previously been the subject of criticism.

Aside from what might be regarded as normal improvements in transmission refinements, such as better rendition of images having high detail or definition, and advances in the ability to pick up and deliver scenes under relatively poor conditions of lighting, there were at least three more striking accomplishments demonstrated during the year 1940.

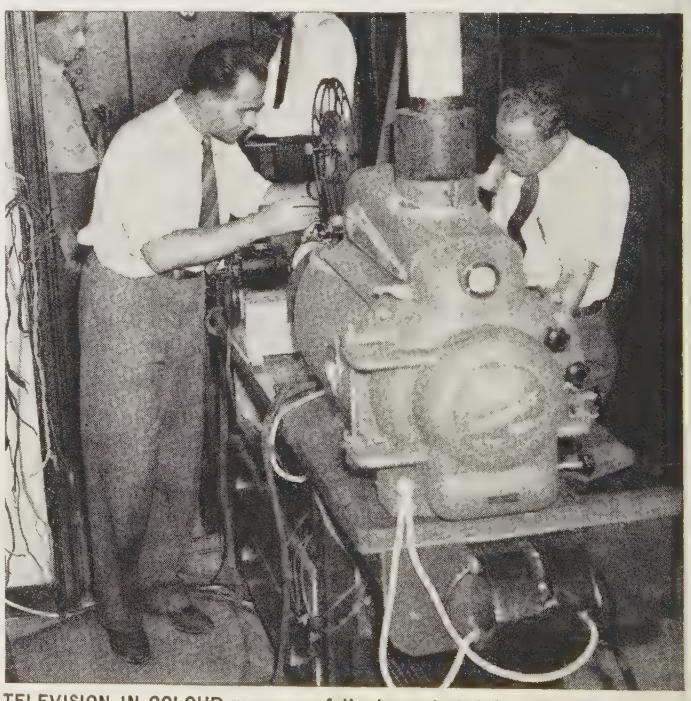
The first of these was the use of automatic relay stations for passing the television images from point to point or from town to town, which might remove the limitation of service radius that generally characterized a single television transmitter and which thus might pave the way toward the organization of television chains or networks broadly similar to those which have been so prominent in sound broadcasting.

The second was the showing of television in full colour, which represented an impressive contribution toward the realistic reproduction of views in which the colour content, rather than the general pictorial value, is important.

The third was represented by private showings of large-screen television reproduction, in which images having detail as good as the best obtainable on small screens were projected with sufficient enlargement to be visible to theatre audiences. Public demonstrations of such advances were expected during 1941, and they should be important in helping to define the future relations between television and the theatre motion picture.

(*See* also PHOTOGRAPHY: *Motion Picture Photography.*)

(J. V. L. H.)



TELEVISION IN COLOUR was successfully demonstrated Aug. 29, 1940, by its inventor, Dr. Peter C. Goldmark (left), shown adjusting a film scanner

Tennessee, a south-central state of the American union, the 16th state to enter the union, popularly known as the "Volunteer State"; state flower, iris; state bird, mocking bird; area, 42,022 sq.mi.; population according to the U.S. census of 1940, 2,915,841; capital, Nashville, population, 167,402. The only city with larger population is Memphis with 292,942.

In the decade 1930 to 1940 Tennessee rose in rank from 16th to 15th among the states with respect to total population.

History.—Governor, Prentice Cooper; secretary of state, A. B. Broadbent; attorney general, Roy Beeler; commissioners as follows: agriculture, C. C. Flannery; conservation, J. Charles Poe; education, B. O. Duggan; finance and taxation, George McCandless; highways and public works, C. W. Phillips; institutions, A. T. Taylor; welfare, Paul Savage; insurance and banking, J. M. McCormick; labour, S. E. Bryant; public health, W. C. Williams; railways and public utilities, W. D. Hudson, Porter Dunlap and Leon Joroulman.

The election returns were as follows: president: Roosevelt (Dem.), 351,601; Willkie (Rep.), 169,153; Babson (Prohibition), 1,606; Thomas (Soc.), 463. U.S. senator: McKellar (Dem.), 295,440; Baker (Rep.), 121,790; Neal (Ind.), 35. Governor: Cooper (Dem., re-elected), 323,466; Bruce (Rep.), 125,254. Railway and public utilities commissioner: Dunlap (Dem.), 278,793; Maddox (Rep.), 103,935.

Education.—Per cent of illiteracy in 1930 for whites was 5.4, for Negroes, 14.9. Of 5,712 elementary schools 1,484 had 3 or more teachers in 1939; one-teacher elementary schools declined from 3,555 in 1927 to 2,632 in 1939. Enrolment in elementary schools was 524,881. In 1939, all but 5·7% of elementary teachers had more than high school training; 22·3% were college graduates. The state maintained in 1940 seven institutions for higher learning with an enrolment at the regular session of 10,630 students in 1938–39. The estimated valuation of these was $15,050,001 in 1935. In addition there were separate schools for the blind, the deaf and underprivileged children; three state hospitals for the insane; a home and training school for feeble-minded; and four training or correctional schools, respectively for white boys, Negro boys, white girls and Negro girls; a commission and workshop for the blind; and two state penitentiaries.

Finance.—In 1940 there were 71 national banks with 17 branches and 226 state banks with 32 branches, with assets of $477,891,000 for national, and $165,573,000 for state banks. Savings and loan associations numbered 49 with assets of $26,948,211. Insurance payments made by policyholders amounted to $65,576,741 in 1939.

In 1939 there were 551 companies licensed to write insurance in the state.

Agriculture.—There were 273,783 farms in 1935; 1,308,420 farm population; 19,085,837 ac. in farms with 6,134,200 ac. of crop land harvested. Estimated value of crop production was $86,577,000 in 1939. Corn 2,635,000 ac., 52,700,000 bu.; cotton, 726,000 ac., 450,000 bales; hay, 1,621,000 ac., 1,629,000 short tons; tobacco, 117,900 ac., 112,716,000 lb. Cattle on farms Jan. 1, 1940 were 1,228,000; hogs, 1,258,000; horses and mules, 458,000. Cash farm income from crops was $58,470,000 in 1939; from livestock and livestock products, $58,195,000; government payments to farmers were $15,713,000; gross value of agricultural production for the state was $167,623,000. Cash farm income was $116,665,000 in 1939. Tuberculin testing of cattle in the state was completed in 1935. Commercial forest area in 1929 was 14,000,000 ac. The cut in 1935 was 337,008,000 board feet, total value of lumber products $11,944,159, of which $6,831,597 were added by manufacture.

Manufactures.—In 1937 there were 1,991 manufacturing plants yielding products valued at $707,986,784, of which $295,626,708 constituted value added by manufacture. Value of mineral production was $34,893,847 in 1937. Tonnage of bituminous coal production in 1938 according to the Tennessee department of labour was 4,378,586 short tons; limestone, 5,111,503 short tons; phosphate rock, 1,081,798 short tons. The number of wage earners in manufacturing increased from 107,645 in 1925 to 135,073 in 1937.

Manufacturing and urbanization are making marked progress in the state.

The Great Smoky Mountain national park with 174,230 ac. in Tennessee attracted 860,960 visitors for the year ending Sept. 30, 1940.

The per capita income of the state was $296 in 1939.

(C. E. A.)

Tennessee Valley Authority. The Tennessee Valley authority, a corporative regional agency of the United States government, created by act of congress in 1933, had, in 1940, developed a commercially useful channel in 464 mi. of the Tennessee river as far upstream as Chattanooga, Tenn., provided behind its dams 4,000,000 ac.ft. of storage capacity reserved for flood control, and attained an electrical generating capacity of 984,800 kilowatts from which electricity was being supplied to 75 municipalities and 38 electric co-operatives in the valley (which consists of portions of Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee and Virginia).

In the furtherance of TVA's five-fold mandate to develop navigation, flood control, electric power, national defence and the region's agricultural economy, congress had appropriated $335,000,000 to Aug. 1, 1940, and had authorized TVA to issue $70,000,000 in bonds (of which $60,000,000 has been issued) in the largest construction and regional development programs ever directly undertaken by the U.S. government. In addition, TVA, since its inception, had utilized Wilson dam, near the southernmost tip of the Tennessee river, representing an investment of $31,300,000.

Congress in 1940 authorized construction of Cherokee dam as part of an emergency program to increase TVA's electrical output for industrial production in the national defence. Under construction in 1940 were Cherokee, on the Holston river 35 mi. from its confluence with the Tennessee river; and, on the Tennessee river, Kentucky dam, at mile 22·3 from the mouth, Watts Bar dam, at mile 529·9, and Fort Loudoun dam, at mile 602·3. The working schedule called for completion of Cherokee and Watts Bar in 1942, Fort Loudoun in 1944, and Kentucky in 1945.

TVA dams on the Tennessee river in the order of their progression up the 650-mile waterway were as follows, with those under construction in 1940 indicated parenthetically in their sequence: (Kentucky dam, mile 22·3, in Kentucky); Pickwick Landing dam, mile 206·7, in Tennessee; Dam No. 1, mile 256·8, in Alabama; Wilson dam, mile 259·4, in Alabama; Wheeler dam, mile 274·9, in Alabama; Guntersville dam, mile 349, in Alabama; Hales Bar dam, mile 431·1, in Tennessee; Chickamauga dam, mile 471, in Tennessee; (Watts Bar dam, mile 530, in Tennessee; Fort Loudoun dam, mile 602·3, in Tennessee).

Tributary storage dams built and operated by TVA are Norris dam, in Tennessee, on the Clinch river, 79·8 mi. from the mouth, and Hiwassee, in North Carolina, on the Hiwassee river, 75·8 mi. from the mouth.

Every one of the mainstream dams creates a link in a chain of lakes providing slack-water navigation the year round. Nine-foot navigation was provided by Ohio river dam No. 52 of the United States army engineers for a distance of 22·3 mi. up the Tennessee from Paducah, Ky., to the point at which Kentucky dam was

being built. The 184·3 miles next upstream to Pickwick Landing dam had a controlling minimum depth of 6 ft. at extreme low water, but generally 7- to 7½-foot depths were maintained and the full 9-foot channel was to be completed by Kentucky dam. From Pickwick Landing the 257·4 mi. upstream to Watts Bar, 58·9 mi. beyond Chattanooga, the then head of navigation, the 9-foot channel was maintained, except for short stretches in which minimum controlling depths of 7 and 6 ft. remained to be increased to the standard navigation depth of 9 ft., principally by dredging. Controlling channel depth was to be increased to 9 ft., with 2-ft. overdepth, the entire 650 mi. between Paducah, Ky., and Knoxville, Tenn., by the dams under construction, and incidental development, including dredging, all to be completed in 1945.

The authority in 1940 was supplying to municipal and co-operative systems, for distribution to more than 405,000 customers at uniformly low retail rates, electrical energy carried over approximately 4,900 mi. of TVA transmission lines, and was supplying electricity to large industrial consumers, among them the Aluminum Company of America, the Monsanto Chemical company, the Victor Chemical works and the Electro-Metallurgical company.

In 1940, sales of electricity by the authority amounted to more than $15,000,000 annually. The TVA basic residential rate schedule per month was in 1940: for first 50 kw.hr., 3¢ a kw.hr.; for next 150 kw.hr., 2¢ a kw.hr.; for next 200 kw.hr., 1¢ a kw.hr.; for next 1,000 kw.hr., 4 mills a kw.hr.; for all over 1,400 kw.hr., 7½ mills a kw.hr.

The installed capacity of the authority's power system in major plants reached 984,800 kw. in 1940. Normally, installations to increase total capacity to 1,207,000 kw. were to have been added by 1943. To provide an increased supply of electricity required for the national defence program, congress instructed the authority to carry out an emergency schedule to increase the generating capacity by 300,000 kw. in addition to the normal installations. Principal elements of the emergency program were Cherokee dam, which would have a generating capacity of 90,000 kw., and a steam plant of 120,000 kw. capacity in the vicinity of Watts Bar dam. The normal and emergency installations totalling 518,600 kw. were scheduled to be completed by Oct. 1942.

TVA and 73 municipalities and co-operatives acquired utility properties from privately owned companies for purchase prices totalling $116,700,000. The authority purchased transmission lines, generating plants and several of the smaller distribution systems for $55,500,000. The municipalities and co-operatives paid $61,200,000 for the major distribution systems and for relatively minor water and gas properties that were associated with the electrical holdings.

The total acquired distribution properties served approximately 288,135 customers in Alabama, Georgia, Mississippi, North Carolina and Tennessee. Largest single purchase was consummated in 1939 when TVA, 22 municipalities and 11 co-operatives bought all the electric properties of the Tennessee Electric Power company, serving 142,110 customers, for $78,600,000, of which the authority's share was $44,949,400.

Flood control by TVA dams, estimated to effect an average annual saving of $100,000,000 in flood damages on the Tennessee and portions of the Ohio and Mississippi rivers, was to be increased by addition to the system of Cherokee dam, whose reservoir would be of the heavy storage type, as are the Norris and Hiwassee reservoirs. Controlled storage at TVA dams was 4,000,000 ac.ft. and would be increased to 10,000,000 ac.ft. by dams under construction, principally by Cherokee and Kentucky dams.

At the Muscle Shoals munitions plant, constantly maintained in a state of readiness for defence production, highly concentrated phosphate fertilizer developed by the authority had been produced to a total of more than 290,000 tons in seven years. About 111,000 tons of the superphosphate had been distributed to 30,683 privately owned farms, covering 4,890,000 ac. in 22 states, where, with the co-operation of state agricultural extension services, it was used to demonstrate how an improved plant food, low in cost to the land, can aid agriculture. The authority in 1940 set about rehabilitation and enlargement of other portions of the Muscle Shoals plant to produce ammonium nitrate for use in munitions.

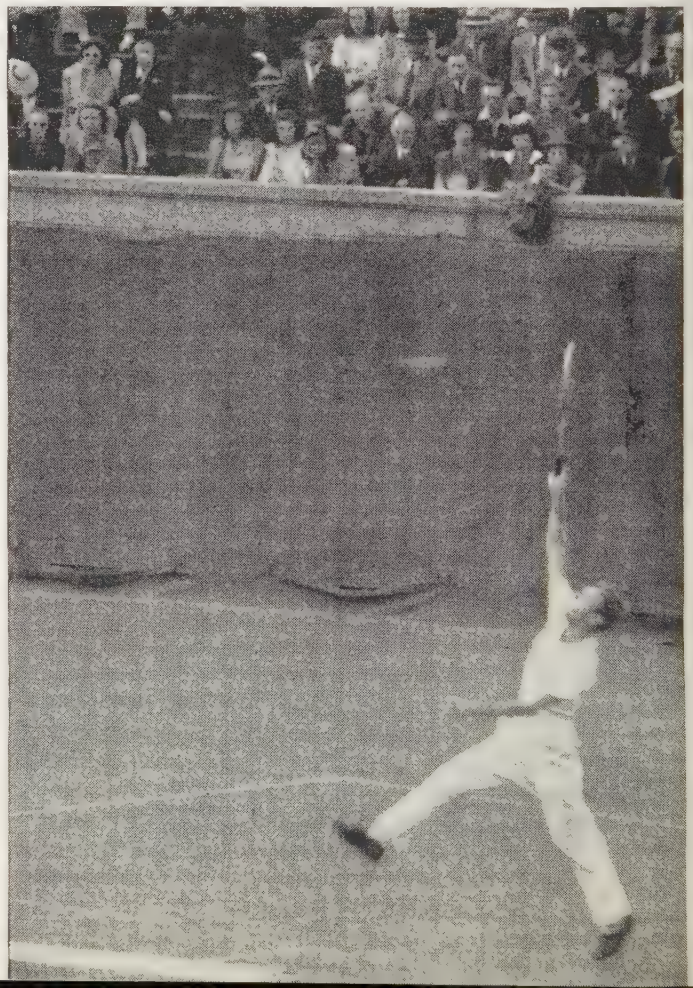
In 1940 TVA announced the discovery by one of its engineers, John H. Walthall, of a means for producing alumina, the raw material of aluminium, from clays which the valley contains in great abundance.

The authority's relationship with its employees, who had fluctuated in number between 11,000 and 17,000, was formalized by the execution of a contract agreement in 1940 between TVA and the Tennessee Valley Trades and Labor council, which represented 15 union labour organizations affiliated with the American Federation of Labor. This document was the first contract agreement with organized labour ever entered into by the federal government.

The authority is headed by a three-member board of directors: Dr. Harcourt A. Morgan, chairman; David E. Lilienthal, vice-chairman; and James P. Pope. The board's policies are executed by a general manager, Gordon R. Clapp. (*See* also ELECTRICAL INDUSTRIES; PUBLIC UTILITIES.) (W. L. S.)

Tennis. The season of 1940 was largely concentrated in the United States, the only major tennis-playing nation which was not engaged in war. With the exception of a few sporadic meetings held in late winter and early spring in Italy and Germany, no tournaments were held on the continent during the year. All matches in England were abandoned and the All England Club building at Wimbledon was turned into a first aid post

DON McNEILL of Oklahoma City dethroned Bobby Riggs as U.S. national tennis champion Sept. 9, 1940, at the Forest Hills, L.I., tournament



for that borough. Naturally, the matches for the Davis cup were not held, the trophy itself remaining in the hands of Australia, the tennis champion nation.

Save for the United States, Australia was the only important country to hold a national tennis championship during 1940. England did not hold any; France did not hold any; Japan, Germany and Italy did not hold any. The Australian championships took place at Sydney, N.S.W., in January. This tournament was remarkable for the fine play of Jack Crawford, the veteran Davis cup player, who defeated John E. Bromwich, the champion, in the semifinal round. Crawford, however, was no match for Adrian Quist who won the finals in three sets. Quist, who won his first singles title in 1936, captured the doubles title with Bromwich and became doubles champion for the fifth time in succession.

During the remainder of the year pretty much the only first class play was on the American continent. Two players stood out in the United States: Robert L. Riggs the champion and Don McNeill the third ranking star. They had a series of struggles starting at the indoor championships in New York in March when Riggs deprived McNeill of his title by beating him in five sets in the finals. McNeill turned the tables in June, conquering Riggs on dirt and winning the clay court championships at River Forest, Illinois. Riggs retaliated in the finals of the eastern grass court championships at Rye, New York, in August, defeating McNeill in the finals in four sets.

With no noteworthy foreign representation, the 59th National Singles Championships held as usual early in September at the West Side Tennis club, Forest Hills, L.I., was interesting chiefly because of the rivalry between these two players. Neither was seriously threatened on the way to the finals. There Riggs worked quickly into a lead of two sets to none and apparently had the match well in hand. He became careless and McNeill fought to victory by taking the net at every chance throughout the last three sets.

Alice Marble of California dominated the woman's field even more than in 1939. There was no one in her class and no player of her sex able to extend her. She lost only half a dozen sets all summer, won the doubles championships of the United States with Mrs. Sarah Palfrey Fabyan and the mixed title with Riggs. Her closest rivals of former years, Mrs. Fabyan and Miss Helen H. Jacobs, especially the latter, both fell away. When they met. Miss Marble smothered Miss Jacobs, in one finals, defeating her with the loss of only a single game in two sets, and in the National Championships beating her easily in the last match. In this tournament Miss Marble played five straight matches without losing more than three games in any one set. (J. R. Tu.)

Tetrazzini, Luisa (1871–1940), Italian coloratura soprano, was born in Florence, June 29. She studied at the Liceo Musicale at Florence. Her first appearance was in 1895 at the Teatro Pagliani, now the Teatro Verdi. She then sang in the Argentina theatre in Rome and not long after made a tour of South America, singing in Buenos Aires, Rosario, Montevideo and Rio de Janeiro. She then filled engagements in Lisbon and Madrid and sang for seven successive seasons in Russia, after which she returned to Italy to sing with Tamagno and Caruso. In 1904 she sang in Mexico and then made her first appearance in the United States at San Francisco. In 1908 she made her debut in New York city under the management of Oscar Hammerstein. For two seasons she appeared with the Metropolitan Opera company of New York; she also sang with the Chicago Opera association in 1913 and 1914. She sang in concert in the United States and Canada in 1921 and made her last appearance in the United States in 1932. Her favourite opera was *Lucia di Lammermoor*. She died in Milan, April 28.

Texas, south-central state of the United States, first a colonial possession of Spain and later a part of Mexico, became an independent republic in 1836 and was admitted to the United States in Dec. 1845. It is sometimes called the "Lone Star State," because of the state flag with a single star. Area, 265,896 sq.mi. (largest in the union); population (U.S. census, 1940), 6,414,824. Capital, Austin, pop. (U.S. census, 1940), 87,930. The three largest cities, according to the 1940 census are Houston, 384,514; Dallas, 294,734; and San Antonio, 253,854. According to the 1940 census about 45% of the population is urban. According to the 1930 census about 72% is white, about 16% is Negro and about 12% is distributed among other races (the Mexicans, living mostly in the southwestern part of the state, comprise nearly all of this last group). Although the 1940 figures were not available, it is not likely that these percentages have changed much.

History.—In the presidential election the Democratic candidates carried Texas by an overwhelming majority. The vote for presidential electors was as follows: Democrat, 840,151; Republican, 199,152; Socialist, 728; Communist, 212; Prohibition, 925.

W. Lee O'Daniel, elected governor in 1938 on a platform favouring $30 per month for all persons over 65 years of age, was re-elected in 1940. The opposition to him in the political campaign was bitter but ineffectual. The legislature did not meet during the year because the governor refused to call a special session.

Other leading state officials who were re-elected were Coke R. Stevenson, lieutenant governor; Gerald Mann, attorney-general; Charlie Lockhart, treasurer; Bascom Giles, commissioner of general land office; J. A. McDonald, commissioner of agriculture; L. A. Woods, superintendent of public instruction; George H. Sheppard, comptroller. The railroad commission will be composed of Ernest O. Thompson, Jerry Sadler and Olin Culberson (newly elected).

During the year, Texas, like most of the nation, turned its attention to the problem of national defence. Work was begun on a great army encampment at Brownwood. At Corpus Christi construction started on a huge air-naval base. The shipyards at Orange received orders to build 12 destroyers. Altogether, between the months of July and November of 1940 the national defence appropriation allotted to Texas was $165,478,000.

Education.—The state maintains a general system of public schools, extending from the primary grades to colleges and the University of Texas.

In 1940 the scholastic population, from six to 17 years inclusive, was 1,549,654, of whom 244,024 were Negroes. The schools below college rank are supported by both local taxes and state funds.

The latter, apportioned at $22.50 per pupil, totalled $34,866,215. Fully accredited four-year high schools numbered 1,309. The state also supports 16 institutions of higher learning, including one for Negroes, and 78 public junior colleges. There are more than 20 denominational and privately endowed colleges.

Charities and Correction.—The state maintains 22 eleemosynary institutions. Half of these are hospitals for mental and nervous cases; a new one was completed at Big Springs in 1939, but accommodations for such cases were still inadequate. There are also two sanatoriums for tuberculosis victims; schools for the blind and for the deaf (white and Negro); two homes for delinquent children; two for white orphans and one for Negro; one for defectives; one for crippled children. There is a home for Confederate veterans and one for the widows of veterans. A number of homes for orphans and for crippled children are supported by private means, religious sects and fraternal orders. The state prison system is extensive; the principal unit is the penitentiary at Huntsville.

Banking and Finance.—The 446 national banks in Texas, according to the report of June 29, 1940, showed a total capital stock of $72,881,000, plus surplus, profits and reserves of $82,760,000; deposits, $1,405,510,000; loans, $429,607,000; cash reserves, including balances with other banks, $714,796,000; total resources, $1,566,211,000. The 393 state banks, according to the report of June 29, 1940, showed a capital stock of $16,938,000; deposits, $194,202,115; loans and discounts, $88,360,360; total resources, $236,806,794. The state treasury, for the fiscal year ending Aug. 31, 1940, reported total taxes and licences received, $121,524,457; total revenue receipts, $187,409,854. At the end of 1940 a cash balance of $16,000,000 was announced, despite a bonded indebtedness of $12,990,450, and deficits in the general revenue fund and the Confederate pension fund of $23,296,519 and $1,987,405, respectively.

Agriculture, Minerals and Manufactures.—The drought that had damaged crops during 1939 was broken in 1940. Cotton prices stayed about the same, although cotton was put on the market later than in dry years. Cattle prices were 40% higher than in 1939; hogs, 25% higher; sheep were 40% lower; and the total farm cash income was $450,000,000 as compared to $314,765,000 in 1939.

The value of the following crops, according to figures and estimates furnished by the bureau of business research of the University of Texas, showed an increase: The cotton crop of 3,479,000 bales brought $132,800,000 in 1940 as compared with $123,647,000 in 1939; cottonseed (1,113,000 tons) brought $20,814,000 as compared with $17,859,000 in 1939. The corn crop of 14,116,000 bu. brought $5,720,000 or almost $2,000,000 more than the 1939 crop. Wheat, yielding 24,700,000 bu., brought $16,573,000 as compared with $15,089,000 in 1939. Grain sorghum, with a crop of 13,461,000 bu., brought $5,931,000, or over $1,000,000 more than the 1939 crop. These figures, as well as those to follow for livestock production, are based on cash income and do not take into consideration produce consumed on farm and ranch but not sold. In 1940 cattle and calves yielded an income of $81,856,000—almost $12,000,000 less than the 1939 income. Hogs brought less also, $99,643,000, as compared with $111,900,000 in 1939. Sheep brought $11,497,000, or over $1,000,000 more than in 1939. In addition, an income of about $32,000,000 for milk and about $6,000,000 for poultry, eggs and turkeys raised the total cash income. Wool and mohair clip, representing an important industry, made considerable gains over 1939, wool clip yielding 84,000,000 lb., valued at $23,132,000 as against $17,899,000 in 1939, and mohair clip yielding 15,345,000 lb., valued at $9,584,000, as against $6,779,000 in 1939.

The value of the sulphur produced in 1940 was estimated at $37,000,000; the value of the gas produced, at $25,000,000.

The petroleum reserves of Texas were estimated at about 10,000,000,000 bbl., or about 50% of U.S. reserves. According to the latest figures furnished by the bureau of business research at the University of Texas, the state produced about 43% of the U.S. petroleum yield during 1940, or about 558,320,000 bbl. The Texas Railroad commission curtails the production of oil by means of proration and the shut-down. Consequently the potential output is almost 20 times the actual output. The year's production of oil was valued at approximately $558,320,000.

(C. W. Ra.)

Texas, University of. Fifty-eighth annual session opened Sept. 21, 1940. Main library holdings climbed to the 639,732-volume mark, ranking the collection first in the south, 13th in the nation. During the 1939–40 college year, the university was host to about a score of state-wide conferences, on such topics as the state and public education, war and the western hemisphere, radio in education, banking, folklore, personnel problems, soil mechanics, traffic engineering, air conditioning and adult education. On June 20, 1940, Dr. R. L. Sutherland was named director of the university's $2,500,000 Hogg lecture foundation, which also has a division for mental health. On June 22, Charles T. McCormick was named dean of the school of law. During the year university faculty and staff members published 500 items, including 30 books. Construction was started in the fall of 1940 on three new buildings—music, petroleum and chemical engineering—to bring the college's total to 49. For the 1940–41 session 23 new teaching posts were created. Enrolment for the fall semester to Oct. 28, 1940, totalled 10,320, an all-time high, at the main university. An additional 397 were enrolled in the school of medicine at Galveston and 169 in the college of nursing there.

(H. P. R.)

Textile Industry. For the second consecutive year, events in Europe in 1940 transformed a routine textile market into one of feverish activity. Just as the outbreak of the European war in the fall of 1939 created boom conditions in domestic textiles, so did the U.S. national defence program in the spring of 1940. However, the main difference between the two movements was that the defence effect was far the more lasting of the two, and in fact promised to be one of the major impulses in the industry for some time to come.

In dollars and cents, approximately $400,000,000 was spent or committed by the quartermaster of the United States army for clothing and equipage during the brief period from June 30 to Dec. 1. This represented the major part of the buying in this field for the army authorized by the 76th congress for the fiscal year ending June 30, 1941. However, the recognition of the increasing gravity of the international situation, as presented in the president's message to the 77th congress, meant the inevitable addition of sizeable appropriations for expenditure before the end of the fiscal year in 1941 and also foreshadowed continued active government purchasing during the following fiscal year.

The net result of this and other influences was a record high for textile mill activity, the second consecutive year in which a record was set. *Textile World's* index of mill activity for 1940 was 142 (on the basis of 1923–25 as 100). This new high represented an increase of 8% over the index of 132 for 1939, the previous record year. It can be compared with 115 for 1929, and with 125 for 1937, the third highest year in the last decade.

Fashion Shift.—Another spectacular effect of war in Europe upon textiles in the United States was the shift of the responsibility for fashion leadership from Paris to New York. Various agencies involved in or concerned with the fashion cycle hastened to accept this challenge and the result was a completely new attitude toward the role which this country must play in the future. Specific contributions were the fashion shows staged by retail groups and by a co-operative movement in New York city.

Synthetic Fibres.—What was merely a potential factor in 1939 became an actuality in 1940. May 15 of the latter year was "nylon day" and one of the most remarkable retail stampedes developed when women's hosiery, made of this new synthetic, first appeared in the stores. From a quantity standpoint, however, the production of nylon hosiery was limited in 1940, due to the limitation in the output of the yarn itself. By November, for example, shipments of women's full-fashioned nylon hosiery amounted to 9·7% of the women's full-fashioned total for that month. However, this percentage increased each month and there was every reason to expect the gradual usurpation by nylon of a large part of silk's outlet in the women's hosiery field.

Since this is the last major stronghold of silk, it represents a very serious challenge to that fibre. Of course, the exigencies of

the defence program might delay this development, since nylon was being used in 1940 as an experimental substitute for silk in parachute cloth, and continued call for that fabric might decrease the supply of nylon available for hosiery use. Another important new synthetic, vinyon, found its first use in filter cloth but at the beginning of the year it was already getting into the apparel field, its introduction being in the form of a material for women's gloves.

Textile Processes and Machinery.—The major trend in textile technique was toward greater efficiency of operation and toward more completely automatic machinery and the elimination of intermediary processes. Typical developments in this direction included: continued rapid replacement of mule spinning of woollen yarns by ring spinning; extension of headless package twisting to the silk and rayon throwing field, with resulting elimination of certain operations; and perfection of high-speed printing machines.

Also of interest in the realm of technological advance were the manufacture, for the first time, of warp knitting machines in the U.S.A.; and the development of a process for electrocoating of textiles, both for decorative purposes and for the complete manufacture of pile fabrics. The latter was another portent of the potentiality of radical machinery changes in the years to come, involving even the possibility of complete replacement of some of the standard forms of equipment used. (*See* also COTTON; RAYON; WOOL.) (D. G. Wo.)

Thailand: *see* SIAM.

Thayer, Ernest Lawrence (1863–1940), U.S. journalist, was born in Lawrence, Mass., Aug. 14, and was graduated from Harvard university in 1885. In 1887 he was employed on the staff of the *San Francisco Examiner* and in June 1888 his poem "Casey at the Bat," made famous by DeWolf Hopper, appeared in that paper. He died in Santa Barbara, Calif., Aug. 21.

Theatre. The more noteworthy events in connection with the theatre in the U.S. in 1940 were six in number:

1. The award of both the New York Drama Critics' Circle plaque and the Pulitzer prize to William Saroyan's *The Time of Your Life* as the best play of the 1939–40 season. This was the first time since the inauguration of the critics' award that the Pulitzer committee followed the critics' choice.

2. The continued run of *Tobacco Road* into its eighth year, establishing an all-time record in the U.S. theatre.

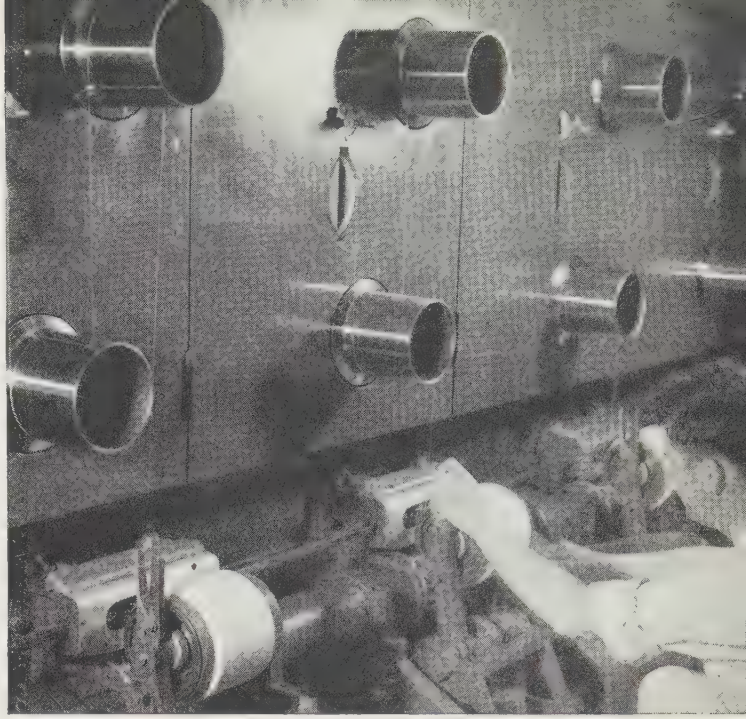
3. The increased prosperity of the road theatre, notably in the later months of the year.

4. The production of numerous musical shows in the later months in the apparently sound managerial belief that this species of entertainment is particularly acceptable in times of world and national stress. Among the more successful exhibits in this period were *Boys and Girls Together, Cabin in the Sky, Panama Hattie* and *Hold On to Your Hats,* all money-makers.

5. The sincere effort of many of the New York managers to prevent wildcat ticket speculation, with the achievement of some at least fairly promising results.

6. The increase in the number of summer theatres, but the failure of the great majority of them to prosper. The summer theatre season also witnessed an increase in travelling units headed by star actors and actresses.

Other points of interest were, first, the box-office success of the Playwrights' company's production of Robert Sherwood's admonitory drama dealing with the invasion of Finland, *There Shall Be No Night,* with the Lunts in the leading roles,



NYLON YARN being wound on bobbins. Hosiery of this product was placed on general sale in the United States May 15, 1940

and the company's failure with Maxwell Anderson's deficient play about Jesus at the age of 12, *Journey to Jerusalem,* which played to no business and collapsed after just 17 performances. Secondly, the refusal of the Critics' Circle to give its annual honourable citation to a play of foreign authorship on the ground that none produced during the season was worthy of consideration. Thirdly, the news that Eugene O'Neill had not only completed five of the plays in his heroic cycle of nine, dealing with a family in America from the late 1700s to the early 1930s and called in its entirety *A Tale of Possessors Self-Dispossessed,* but had finished two full-length plays apart from the cycle named, respectively, *The Iceman Cometh* and *Long Day's Journey into Night.* O'Neill will not permit production of any plays in the cycle until the whole work is complete and disinclination to undergo the strain of rehearsals also caused him to defer production of the two separate plays until a later date. Fourthly, the continued national box-office success of the comedies, *Life with Father,* played by three different companies, and *The Man Who Came to Dinner,* similarly played by three. The reception of both throughout the country echoed their popularity in New York. And fifthly, the combination of Helen Hayes and Maurice Evans in a successful revival of Shakespeare's *Twelfth Night.*

The most amusing popular comedy, aside from the already mentioned *Life with Father* and *The Man Who Came to Dinner,* was the Thurber-Nugent *The Male Animal.* Among the biggest 1940 musical show successes, in addition to those noted for the latter part of the year, were Cole Porter's *Du Barry Was a Lady* and Irving Berlin's *Louisiana Purchase.* The year, incidentally, was a heyday for musical show comedians. Not only did Al Jolson and Ed Wynn rush back to the stage after long absences, but Bert Lahr, Victor Moore, Joe Cook, Bobby Clark and various others of the clan added themselves to the theatre's gaiety.

An organization called the Negro Playwrights' company attempted to launch itself with a play about the despair of the Negro in a white man's world—it was named *Big White Fog* and was by Theodore Ward—but made a poor start. The mad shambles called *Hellzapoppin* continued in the third year of its run to fill the Winter Garden. The commonly successful collaborative team of Kaufman and Hart disappointed their admirers with a feeble comedy, *George Washington Slept Here.* William Saroyan gave further evidence of his fecundity by producing a ballet, *The Great American Goof,* which was pretty bad, a delightful comedy,

Left: ERNEST HEMINGWAY'S *The Fifth Column*, which popularized a Spanish Civil War general's phrase and gave it to the English language, opened on Broadway March 6, 1940, starring Franchot Tone

Below: THE FIRST THEATRICAL "HIT" of 1940 on Broadway was James Thurber's comic *The Male Animal*, written with Elliott Nugent. The play brought to life Thurber's famous series of cartoons on the war between the sexes

Below, left: THE FIRST PLAY ABOUT THE EUROPEAN WAR, *There Shall Be No Night*, by Robert Sherwood, opened at New York city in May 1940. Alfred Lunt and Lynn Fontanne played the lead parts in the drama of a Finnish family during the Russian invasion

Below, right: EDNA FERBER acted in her own play, *The Royal Family*, in 1940 during the summer season at the Maplewood, N.J., theatre

Love's Old Sweet Song, and three additional plays, *Sweeney In the Trees, The Hero of the World,* and *Something About a Soldier,* tried out in the summer theatres. Only the first named of the three, however, seemed to have even modest possibilities for the New York stage. Saroyan also completed still another play, *Across the Board on Tomorrow Morning,* but it was still unproduced by the end of 1940.

The European situation brought a large influx of German, Austrian and French playwrights, actors, composers and directors, but nothing that any of them offered during the year proved to be of any material value to the local theatre. Successful revivals aside from *Twelfth Night* were Sean O'Casey's *Juno and the Paycock, Charley's Aunt,* that venerable ancient, and the melodrama, *Kind Lady.* George Bernard Shaw's *Geneva* was a dismal failure, thus continuing the Shavian falling-off with American audiences, at least so far as his later plays are concerned. Among other better-known playwrights who failed to make the critical grade were the before noted Maxwell Anderson, Sidney Kingsley, J. B. Priestley, Paul Vincent Carroll, Elmer Rice, Clifford Odets and John Van Druten. Various writers who tried their dramatic wings for the first time and found they were still too inexperienced to fly were Ernest Hemingway in *The Fifth Column;* Dorothy Thompson in *Another Sun* and Vincent Sheean in *An International Incident.*

Box-office failures that deserved a better fate were the earlier mentioned Saroyan's *Love's Old Sweet Song* and Paul Osborn's *Morning's at Seven.* Box-office failure that emphatically did not: the Laurence Olivier-Vivien Leigh revival of *Romeo and Juliet.*

In the concluding months of the year, no less than four plays dealing with Hollywood were exhibited in rapid succession on the metropolitan stage, to the particular amusement of nobody. As for the principal producing units, the Theatre Guild, after a protracted bleak period, at last managed a much better season through the device of allying itself with proficient outside producers; the Group theatre produced three plays, which got nowhere; and the Mercury theatre failed to make any appearance at all.

(G. J. N.)

Statistics.—*Tobacco Road,* at the time of its seventh birthday on Broadway Dec. 4, 1940, had set several amazing records and had outdistanced the *Abie's Irish Rose* record of 2,327 consecutive performances. Following are some of the statistics concerning the play at the beginning of its eighth year in New York city: Number of performances, 2,972; number of states toured, 42; gross income in New York city, $1,820,000; gross income on tour, $2,482,000; total net income, $1,800,000.

Of the original members of the cast in New York city only Edwin Walter, who played the part of the banker, remained with the play on the completion of its seventh year. He had appeared in 2,930 performances. Five Jeeters had been in the New York cast, with the following number of performances: Henry Hull, 233; James Barton, 1,899; James Bell, 305; Eddie Garr, 120; and Will Geer, 415.

Statistics of the Theatre in New York City, 1940

Productions	116
Musical comedies	29
Plays	87
Premieres	75
Successful productions	22
Performers employed	1,659
Tickets sold	6,948,000
Approximate cost of productions	$2,000,000
Estimated number of shows booked for other cities	103

(X.)

Great Britain.—The British theatre during 1940 was restricted in scope and temper by the war. During the winter of 1939–40, while there was little or no bombing of open towns, the industry of entertainment was briskly employed and musical shows abounded and prospered. Some were small and clever, others were large and obvious in their appeal. Whichever had merit of its kind was sure to prosper as a source of refreshment for troops on leave. The most successful revue authors of the period in London were Herbert Farjeon, Robert Barbour and Eric Maschwitz.

Serious drama was scarce. Emlyn Williams was the only dramatist to come forward with a new and successful work of ambition, *The Light of Heart,* a capably poignant study of the rise from decline and subsequent fall of a great actor whose weakness lay in alcohol. In normal times this effectively theatrical piece might not have been so much acclaimed, but, as a somewhat lonely example of the "straight" play, performed by a first-rate cast, it became, for a while, a great success.

So did Miss Aimée Stuart's *Jeannie,* a neat little piece about a Scottish Cinderella with a Yorkshire commercial traveller as her Prince Charming. This introduced a remarkable new actress, Miss Barbara Mullen; although the part was a Scottish one and most convincingly played, Miss Mullen is an Irish girl from the Isle of Aran; she immediately captured London with her first appearance in a leading role.

But the run of both these pieces was cut short by the flare-up of the war in the summer, and in September the aerial attack on London closed the theatres almost entirely, only a few matinees being given. During the spring an attempt had been made to restore the "Old Vic" to its normal activities by John Gielgud, who appeared there at the head of star casts in the title role of *King Lear* and as Prospero in *The Tempest;* unfortunately the war bore very hardly on the second half of the short season.

An American play which was experimentally produced so caught the public fancy that, even in this desperate summer, it was transferred to a central playhouse. This was *Thunder Rock* by Charles Ardrey, its special point of appeal being its call for general participation in the world-battle for justice. The play had imagination and used the stage with a fresh command of fantasy as well as with a summons to exchange escapism for a sense of responsibility and the practical service which that involves.

There could be no visits of foreign companies to London; but the British council did send the Vic Wells ballet company on a tour of Holland, from which country it escaped with only a moment to spare.

Once home, it performed again at Sadler's Wells, where opera and ballet proved exceptionally popular even at the most difficult time. There was a short, but popular, season of Shakespeare at the Open Air theatre in Regent's park; restriction on lighting limited this to matinees.

During the year a council for the encouragement of music and the arts was formed with government support and this determined, among its many functions, to take the best kind of theatre and music to the industrial areas. Hence there were special tours with Shakespeare and Goldsmith in Lancashire and South Wales, while the Sadler's Wells opera company, when London became an impossible site for evening performances, went to the north with *Figaro* and *La Traviata.* It was an extremely difficult time for the repertory theatres, and naturally no new playwright had the chance to emerge, but several players either made or confirmed their positions on the British stage, notably Miss Barbara Mullen and, among the younger men, Michael Redgrave and Stephen Murray.

(I. Br.)

Third Term: *see* Democratic Party; Elections.

Thomson, Sir Joseph John (1856–1940), British physicist, was born in Man-

chester, Dec. 18, and died at Trinity college, Cambridge, Aug. 30. For a biographical sketch see *Encyclopædia Britannica,* vol. 22, p. 152.

Tibet, a country of central Asia, lying N. and N.E. of the Himalayas, mainly a high tableland. Nominally a Chinese dependency, it is in practice independent. The area is about 450,000 sq.mi.; estimates of the population vary from 750,000 to 6,000,000; 2,000,000 is probably near the truth. The religion is Lamaism, a late form of Buddhism modified by animism and primitive magic, and education is in the control of the many monasteries.

The six-year-old boy Lhamo Dhondup, discovered in 1939 after a search lasting some years and officially recognized as the 14th dalai lama, was enthroned in the Potala at Lhasa amid scenes of splendour and pageantry in Feb. 1940. Previously renamed Lingerh Lamutanchu, he received the honorific titles Jampel Ngawang Lobsang Yishey Teuzing Gyasto, meaning "tender glory, mighty in speech, excellent intellect, absolute wisdom, holding the doctrine, ocean-wide." The British and Indian governments alone sent missions, B. J. Gould, political officer for Sikkim representing both and, on behalf of the former, presenting the young potentate with a variety of costly gifts, and some suited to his age, as a mechanical singing-bird and a musical box. These gifts were reciprocated, for on returning to India in September Mr. Gould took with him five cases of presents for the viceroy besides 300 lbs. of special wool to be made into socks for war-workers in the North sea.

The dalai lama and his cabinet received the approval of the Chinese national government at Chungking, and diplomatic interchange between the countries was resumed. Internal peace would seem to be more assured, unless the modernizing tendencies of the nationalists are pushed too fast and far; but much depends on the issue of the Chinese-Japanese war (*q.v.*) and the final settlement in the far east.

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Timber: *see* LUMBER.

Tin. In 1939 world tin production increased 23% over 1938, and to 5% below the high point of 1929, to 183,900 long tons. All of the major producing countries showed material increases; of the intermediate producers, with outputs of 1,000–10,000 tons, Burma and Portugal likewise shared in the increase, but Indo-China, Great Britain, Japan and Australia showed small decreases. Production to the end of Oct. 1940 totalled 193,500 tons, indicating a new record high for the year. The accompanying table gives the details of output for the leading producers, accounting for about 90% of the current total.

World Production of Tin
(Long tons)

	1929	1933	1937	1938	1939
Belgian Congo	1,000	2,200	8,900	7,300	9,700
Bolivia	43,300	14,700	25,100	25,400	27,200
China	6,800	9,500	10,500	11,200	10,900
Dutch E. Indies	35,200	12,600	39,800	21,000	31,400
Malaya	69,400	24,900	77,500	43,200	56,000
Nigeria	10,700	3,800	10,500	7,300	10,900
Siam	10,500	10,300	16,500	13,500	17,000
World total	193,000	91,000	209,100	149,700	183,900

British empire production of tin covers nearly one-half of the world total, but in Great Britain itself the output is only about 2,000 tons annually; aside from the main sources in Malaya and Nigeria, other British territory in Africa produces about 1,600 tons, Australia 3,300 tons, and Burma 5,000 tons.

Although the United States has no appreciable tin output, the country is the world's largest consumer, having during the past 25 years imported amounts averaging 46% of the world output, and in addition has supplemented these imports with secondary tin recovered from previous use, to the extent of 35% of the amount of new metal used. In 1939, imports rose from the 1938 figures but were still short of the record level of 88,000 tons in 1937, the total being 70,100 tons, increasing to 100,000 tons for the first ten months of 1940, under the pressure of the emergency stocking program.

During 1940 the production quotas were: first quarter 120%; second quarter 80%; third and fourth quarters 130%, which carries over for the first half of 1941.

A committee was appointed by the defence commission to study plans and proposals, and make recommendations for the construction of a domestic tin smelter to produce 18,000 tons of tin annually, to be built and operated by the Metals Reserve Co., an agency of the Reserve Finance corporation, and later it was announced that a five-year contract had been made with Bolivian producers to furnish the ore supply. (*See* also METALLURGY; MINERAL AND METAL PRICES AND PRODUCTION.) (G. A. RO.)

Titanium. Both ilmenite and rutile are utilized as sources of titanium, although the former furnished most of the supply; rutile is probably mined not to exceed 1,000 tons a year, while the figure for ilmenite has grown to something like 275,000 tons. India produced 252,200 long tons of ilmenite in 1938 and exported 225,600 tons; amounts up to 9,000 tons were produced by Norway, Senegal, Canada, Portugal, Brazil and Egypt. Although some titanium is used as an alloying agent in steel, the great expansion in demand that has come during the past few years resulted from the development of titanium pigments for paint and ceramic work. Imports of titanium ores into the United States in 1939 totalled 287,600 short tons, as compared with 43,300 tons in 1933. (G. A. RO.)

Tobacco. War and weather sharply reduced tobacco acreage and production in the United States and Canada in 1940, while in Europe, Asia and Australia there was a marked trend to increased acreage, especially of cigarette tobacco, to lessen imports from America. Further restricting the U.S. market abroad, manufacturers of cigarettes and smoking tobaccos in the United Kingdom were required to mix 4% of Greek and Turkish tobaccos in all products in 1940. This is to be increased to 8% in 1941 and manufacturers will be limited to 90% of the quantity of leaf they used in the year ended March 31, 1940. Cigarette advertisers in the United Kingdom were instructed to delete the long-familiar "pure Virginia tobacco." In the United States, 1940 crops of all types of tobacco totalled 1,376,471,000 lb., the agricultural department estimated in December, compared with the all-time record production of 1,858,364,000 lb. in 1939, and a ten-year (1929–38) average of 1,360,661,000 lb. Flue-cured (cigarette type) production in 1940 was estimated at 733,903,000 lb. or about 53% of the record flue-cured crop of 1,159,320,000 lb. in 1939. Acreage was reduced because of poor export markets and to comply with AAA regulations. The acre yield, 980 lb., exceeded the 900 lb. yield of flue-cured in 1939 and was the highest on record. The fire-cured crop was estimated at 99,370,000 lb., an increase over 95,539,000 lb. in 1939. Total production of burley tobacco was 327,708,000 lb. in 1940 and 394,798,000 lb. in 1939. In Canada, with the flue-cured acreage 30% under 1939, frost on Aug. 23 further reduced production and on Sept. 26 destroyed all unharvested leaf, leaving a crop of flue-cured estimated at 24,500,000 lb. compared with 79,700,000 lb. (revised estimate) in 1939. The total Canadian crop of all types was esti-

mated at half that of 1939 which was 109,800,000 lb. Canada, however, had an unusually large carry-over, 118,000,000 lb. as of June 30, 1940 (86,100,000 lb. in 1939 and 67,800,000 lb. in 1938).

A tobacco "holiday" in 1941 was proposed by Cuban growers in the Vuelta Abajo region, which produces about 40% of the Cuban crop. Reasons for the proposal to suspend planting were large accumulations of tobacco stocks, reduced exports and difficulties in making collections from Spain. Growers of lower grades of Cuban tobaccos, which find readier export market, did not favour the "holiday." China in 1940 added its seventh increase in cigarette taxes since 1928. In addition, flue-cured acreage was increased from 110,000 to 132,000 ac. and the 1940 crop was reported as 112,000,000 lb., a decrease because of floods from the 120,000,000 lb. in 1939. Japan increased flue-cured acreage from 71,802 in 1939 to 85,080 ac. in 1940, with a 1940 crop of 124,042,000 lb., compared with 117,125,000 lb. in 1939. The 1940 flue-cured crop in Manchuria was estimated at 53,000,000 lb. from 45,000 ac.,

U.S. Tobacco Production (All Types) by States, 1940 and 1939

	1940 lb.	1939 lb.		1940 lb.	1939 lb.
North Carolina	506,820,000	811,675,000	Connecticut	22,996,000	25,116,000
Kentucky	295,890,000	342,975,000	Florida	16,123,000	23,760,000
Tennessee	103,390,000	110,267,000	Indiana	10,222,000	11,868,000
Virginia	97,540,000	143,847,000	Massachusetts	9,281,000	9,899,000
South Carolina	81,590,000	133,200,000	Missouri	6,300,000	6,290,000
Georgia	76,420,000	95,896,000	West Virginia	2,790,000	2,736,000
Pennsylvania	48,324,000	42,459,000	New York	2,080,000	2,025,000
Wisconsin	36,532,000	31,406,000	Minnesota	920,000	840,000
Maryland	31,920,000	32,800,000	Kansas	488,000	510,000
Ohio	26,430,000	30,295,000	Alabama	415,000	410,000

compared with 39,000,000 lb. from 35,000 ac. in 1939. Australian growers announced a program to double the flue-cured acreage of 7,500 ac. owing to restrictions on imports from non-sterling countries. Thailand's flue-cured acreage in 1940 was about 4,000 ac., double that of 1939. Spain increased the 1940 tobacco area to 33,157 ac., compared with an average of 10,392 before the Spanish civil war. Significantly, 88 ac. were set aside for experimenting with growing flue-cured tobacco. In Poland the flue-cured acreage in 1940 was 4,400 compared with 2,200 ac. in 1939 and Germany was reported to be planning further increase in cigarette tobacco production in Poland. (S. O. R.)

Tobago: *see* West Indies, British.

Todt, Fritz (1891–), German engineer, was born Sept. 4 at Pforzheim and was educated at Munich and Karlsruhe universities. During the World War of 1914–18 he was an officer in the air force. From 1928 to 1933 he was chief engineer in the department of roads, and in 1933 became inspector general of roads. He designed and directed construction for the network of highways in Germany that have served as one of the nation's greatest military assets. He was also chief engineer for construction of the West wall, Germany's equivalent of the Maginot line along the western border. The great speed with which Germany conducted its blitzkrieg drives is attributed in large measure to the system of communications and supplies organized by Todt, who was appointed minister of munitions March 20, 1940 by Hitler. On July 19, 1940 he was extolled by Hitler, speaking before the reichstag, for his part in the military successes of the reich.

Togoland: *see* Mandates.

Tokugawa, Prince Iyesato (1863–1940), Japanese statesman, was born July 11. At the age of 14 he went to England, where he studied for five years. Upon his return to Japan he was appointed chamberlain in the imperial court. When the national diet was set up he entered the house of peers, of which he became president in 1903. He was a delegate to the Conference on Limitation of Armaments at Washington, D.C., in 1921 and visited the United States several times in later years, the last time in 1934 when, at a dinner of the Japan society in New York city, he said that Japan desired settlement of all disputes with both the U.S.A. and Russia. He died in Tokyo, June 4.

Tokyo, capital of Japan, population (1940) 7,001,460; area 257 sq.mi., situated at 35° 41′ N. and 139° 45′ E. at the head of the bay of the same name on the southeast coast of Honshu, the main island of Japan. Tokyo is at once the administrative centre of the Japanese empire, an important industrial and commercial city and an outstanding educational centre. According to the last educational census there were 22 universities in Tokyo, with 46,625 students and 72 professional schools, with 52,165 students. The Japanese capital presents an interesting contrast between old and new Japan, with the modern office buildings in the central section of the city and the many narrow little streets with their innumerable small shops which one finds in the outlying sections. The city has entirely recovered from the tremendous earthquake of 1923 and has been rebuilt along more modern lines.

Life in Tokyo has changed substantially since the beginning of the war with China in 1937. The population has increased by about 750,000, largely as a result of the more intensive effort of the war industries, and during the summer of 1940 there was a marked shortage of water as a result of increased demand, drought and greater use of water power for the generation of electricity. Tokyo is a self-governing municipality with a city council and board of aldermen and a mayor at the head of the administration. Tokyo and its environs rank among the four great Japanese industrial regions, the others being Osaka, Nagoya and North Kyushu. The growth of industry during the last years has been considerable; but precise figures are not obtainable, because of the policy of withholding all information relating to munitions industries and war economic developments. The imperial palace in the centre of Tokyo, surrounded by old walls and a moat, is the regular residence of the emperor. Tokyo has its own harbour, although this is overshadowed by the larger neighbouring port of Yokohama. (W. H. Ch.)

Tokyo-Berlin-Rome Axis: *see* Chinese-Japanese War; Fascism; Germany; Hungary; Italy; Japan.

Tomatoes. Production of tomatoes in the United States in 1940 was 23,404,000 bu., as estimated by the department of agriculture. Production in 1939 was 24,782,000

Tomato Acreage, Production, Yield and Price, 1940, 1939 and 1929–38

Crop	Commercial Acreage			Yield per acre, bu.		
	1940	1939	1929–38	1940	1939	1929–38
Fall	11,800	7,300	6,480	120	76	58
Early (1)	5,000	18,000	13,140	100	160	122
Early (2)	4,000	42,000	20,680	78	88	73
Second early	52,700	51,700	42,550	75	69	85
Intermediate	52,230	48,050	43,810	147	139	134
Late (1)	36,190	36,100	33,700	163	175	147
Late (2)	5,100	7,300	7,900	150	150	124
	Production, bu.			Average price per bu.		
	1940	1939	1929–38	1940	1939	1929–38
Fall	1,420,000	556,000	374,000	$2.11	$2.46	$2.28
Early (1)	500,000	2,880,000	1,608,000	2.85	2.40	2.50
Early (2)	3,190,000	3,713,000	2,174,000	2.38	2.14	2.06
Second early	3,973,000	3,564,000	3,634,000	0.77	1.31	1.24
Intermediate	7,666,000	6,667,000	5,873,000	0.92	0.94	0.91
Late (1)	5,890,000	6,307,000	4,957,000	..	0.81	0.83
Late (2)	765,000	1,095,000	964,000	..	1.50	1.52

bu. and the ten-year (1929–38) average was 19,584,000 bu. The 1940 planting was 204,020 ac. compared with 210,550 ac. in 1939 and a ten-year average of 117,260 ac. Seven crops of tomatoes are grown annually in the United States. The table on p. 665 shows acreage, yield, production and average prices of these seven crops in 1940, in 1939 and in the ten-year average as reported by the U.S. department of agriculture.

Planting for fall and winter harvest (1940–41) in Texas and Florida was 15,400 ac. compared with 11,800 ac. the preceding season; Texas 11,000 ac. and Florida 4,400 ac. for 1940–41 harvest and a total production, preliminary indication, of 1,540,000 bu. Cuba exported 77,989,000 lb. of tomatoes to the United States in the 1939–40 season compared with 44,337,000 in 1938–39. (*See* MARKET GARDENING; TRUCK FARMING.) (S. O. R.)

Tongan Island Protectorate: *see* PACIFIC ISLANDS, BRITISH.
Tongking: *see* FRENCH COLONIAL EMPIRE.

Toronto, with a population of 648,398 (1940) and an area of 34 sq.mi., is the largest city but one of Canada and is the capital of the province of Ontario. It is largely concerned in the industries of manufacturing and mining and in the distribution of goods, and for the last-named purpose is advantageously situated at the centre, as between the east and the west, of the buying power of the dominion. Although there has been a heavy enlistment in the forces, increased production of essential goods has kept pace with a large output of war material. Communications by land, air and water are good. Toronto welcomes a great part of the tourist traffic attracted to Canada. The University of Toronto with over 7,200 students is a famous institution of learning and research. The corporation of the city of Toronto owns the street railway and motor bus transportation of the city, the waterworks system and the local hydroelectric system which has exclusive distribution of electricity for light, heat and power. The Canadian National exhibition, in its 63rd consecutive year of operation, is a great annual event which attracted over 1,600,000 visitors in 1940. The well known Royal Winter fair, with its agricultural, livestock and horse show, held annually, grows steadily in importance. (G. R. G.)

Torpedoes: *see* SUBMARINE WARFARE.
Totalitarian State: *see* EDUCATION, SECONDARY; EUROPEAN WAR; GERMANY; ITALY; RUMANIA; SPAIN; UNION OF SOVIET SOCIALIST REPUBLICS.
Touring: *see* TRAILER TRAVEL.

Tovey, Sir Donald Francis (1875–1940), British composer, pianist and writer, was born in Eton, July 17, and died in Edinburgh, July 10. For a biographical sketch, see *Encyclopædia Britannica,* vol. 22, p. 330.

Town and City Planning. Defence housing, in part temporary, was under construction in many cities and towns of the U.S. for immediate housing of defence workers; but wherever possible the housing programs were being articulated with local city plans for permanent residential neighbourhoods.

The three Greenbelt towns in Maryland, Ohio and Wisconsin, built with public funds, were opened to private development on 99-yr. leases to builders who agreed to build at least 200 houses. The Farm Security administration retained the right to pass on plans and specifications.

Plans were made at Waverly, Baltimore, Md., to arrest the deterioration of the neighbourhood and the depreciation of homes by salvaging or replacing buildings as needed and by other methods which would increase open space and maintain a good living standard in the entire district. Cleveland and Cincinnati, O., made plans to redeem their water fronts—Cleveland by a lower mall between the railroad tracks and Lake Erie, and Cincinnati by redevelopment of blighted districts.

In the Cleveland region plans were issued for a modern highway system, including a system of freeways to be built on the following principles: (1) No access from abutting private property; (2) no grade crossings or left turns; (3) limited access from other streets, at steady-flow intersections only; and (4) a centre division strip.

Most modern zoning ordinances in American cities ban billboards in residential neighbourhoods. But zoning is seldom retroactive. Fort Worth, Tex., in 1940 adopted a zoning ordinance which provided for the elimination of all nonconforming billboards within three years. Lake Worth, Fla., a resort town, prohibited billboards within 200 ft. of the street. In Arlington county, Va., a part of metropolitan Washington, nonconforming billboards were scheduled to come down within 90 days.

In New Hampshire, a newly-planned town, Hill, is to take care of the residents of an old town subject to floods. The town will be provided with adequate open spaces and recreational facilities. The site chosen is well removed from the main highway which will be joined to the town by loop connections.

The Massachusetts State Planning board made in 1940 a study of hill towns of Worcester county and proposed plans for their rehabilitation.

Most city planning commissions in the United States prepared six-year budgets for capital expenditures for public works, as requested by the National Resources Planning board. The New York City Planning commission, the first to be charged with the duty of preparing annual and six-year capital budgets of public works to submit to the board of estimate, has made progress. In 1940 the commission was able to include in its estimates the program for assessables as well as public appropriations. The New York zoning law was amended although not to the extent recommended by the planning commission.

Harrisburg, Pa., and Des Moines, Ia., issued comprehensive replanning studies for the city and region. Generally, it may be said that there was a distinct tendency in American cities to increase parks and open spaces and to provide radial and circumferential parkways. An intercity parkway was planned between Baltimore and Washington. New York was (Jan. 1, 1941) joined with New Haven, Conn., by a series of protected, limited-access parkways, similar to the network of parkways in Westchester county, New York. Many modern through highways and parkways avoided traversing large cities and towns. Instead, branch highways provided direct access to the downtown sections of cities.

The re-created Chicago Plan commission reported in 1940 that steps were under way for a new plan of the city.

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Track and Field Sports. It is estimated that in the U.S. 4,000,000 persons attended track and field meets during 1940, and that a total of $12,000,000 was spent for admissions, coaches' salaries, equipment, prizes, etc.

The appointment of Paul V. McNutt as co-ordinator of all health, sports, recreation and other related fields of activity affecting the national defence of the United States indicated that this sport would gain further impetus. Besides this movement for a wider extension of athletics as a national preparedness measure, a bill was introduced in the house of representatives calling for a complete survey of physical education resources throughout the United States.

Wars caused a triple cancellation of the 1940 Olympic games. First announced for Rome about 1934, then Tokyo and later assigned to Finland, plans for the 1940 Olympiad were finally given up. Finland may not have recovered by 1944 to hold the Olympics, and Britain may not be in a position to conduct the games. If wars continue, the 1944 games will not only be jeopardized but fewer international sports will be held in the future, in the opinion of Evan Hunter, secretary of the British Olympic committee.

American athletes created a new and glowing chapter for the record book in 1940. The cream of track and field athletes

staged their own "American Olympics" during the annual national A.A.U. outdoor championships, at Fresno, Calif. Topped by the new world record of Cornelius Warmerdam in the pole vault, of 15 ft. 1⅛ in., Fred Wolcott tied the 200-m. hurdle race world mark of 22.6 sec. set by Jesse Owens, in 1935. Four new American records were also established: 200 m. in 20.4 sec. by Harold Davis; 110-m. hurdles in 13.9 sec. by Wolcott; 400-m. hurdles in 51.6 sec. by Carl McBain and 1,500 m. in 3 min. 47.9 sec. by Walter Mehl, only one-tenth of a second slower than the world record of Jack Lovelock of New Zealand.

In all, eight national A.A.U. metre records were surpassed and two equalled, including those of world and American classifications: 100 m. run by Davis in 10.3 sec.; high jump of Les Steers of 6 ft. 8¾ in. (he also created a new world record of 6 ft. 9⅜ in. in California); 5,000-m. run by Gregory Rice in 14 min. 33.4 sec.; 1,600-m. relay mark of 3 min. 15 sec. tied by the N.Y.A.C. team. Double victory laurels went to Davis in winning the 100- and 200-m. events, and William Brown in the broad jump and hop, step and jump.

Extraordinary as these feats are, performances in 1940 showed distinctive improvements on 1939 in the astounding number of 15 of the 17 events. In a compilation by Daniel J. Ferris, secretary-treasurer of the A.A.U., the only two events in which 1939 beat 1940 were in the discus throw and in the javelin throw. Only three athletes led in their specialties in both years, Wolcott and Steers showing an improvement in the 120-yd. hurdles and high jump, respectively, and Fox falling two feet behind in his discus throw.

Indoor events.—Indoors, track and field sports continued to surpass each previous year in the number of spectators and competitors. A spectacular turn of events was that the 1-mi. run crown passed from Glenn Cunningham to Charles Fenske, who won eight of the nine publicized mile classics during 1940, his fastest time being 4 min. 7.4 sec. in both the Millrose and the N.Y.A.C. games. Another great performer in trackdom was Gregory Rice, who established a new world mark for 2 mi. in 8 min. 56.2 sec.

Eight records fell in the 17 events of the national A.A.U. championships. The outstanding performance of the meet was the 3-mi. run by Gregory Rice, of Notre Dame, who sped to a new world (indoor) mark of 13 min. 55.9 sec., erasing the 15-year-old record of Willie Ritola. Rice defeated two stellar performers, Walter Mehl and Don Lash. Other new world marks were: Al. Blozis, shot-put, 55 ft. 8¾ in.; Allen Tolmich, 70-yd. hurdles, 8.4 sec.; Seton Hall College relay team, 880 yd., in 1 min. 32 sec. Four new meet records were: Fenske, 1 mi. in 4 min. 8.8 sec.; Charles Belcher, 600 yd. in 1 min. 11.6 sec.; Earl Meadows, pole vault, 14 ft. 3⅜ in.; Barney Ewell and Mozel Ellerbee equalled the old figures of 6.2 sec. for the 60-yd. dash. Joe McCluskey's 2-mi. steeplechase victory represented his 21st national title.

World's Best Track and Field Performances (Outdoors), 1940

100 Yards

9.4 sec.—Jeffrey, United States
9.5—Davis, United States; Morris, U.S.; Brown, U.S.; Ellsworth, U.S.

100 Metres

10.3 sec.—Davis, United States
10.4—Peacock, United States; Brown, U.S.
10.5—Ewell, United States; Mellorowitz, Germany

220 Yards

20.6 sec.—Davis, United States
20.7—Morris, United States; Ellsworth, U.S.
20.8—Ewell, United States
20.9—Orr, United States

200 Metres

20.4 sec.—Davis, United States; L. Orr, Canada
21.0—Ewell, United States; Tarrant, U.S.
21.1—Yoshinka, Japan

440 Yards

46.7 sec.—Belcher, United States
46.8—Orr, United States
47.0—Klemmer, United States
47.2—Breidenbach, United States
47.4—Shaw, United States

400 Metres

46.7 sec.—L. Orr, Canada; Lanzi, Italy
47.0—Klemmer, United States; Harbig, Germany
47.2—Belcher, United States

880 Yards

1 min. 49.8 sec.—Burrowes, United States
1:51.5—Kane, United States
1:52.1—Lightbody, United States
1:52.5—Buxton, United States
1:52.6—Dale, United States

800 Metres

1 min. 48.6 sec.—Woodruff, United States
1:47.8—Harbig, Germany
1:48.9—Lanzi, Italy
1:51.1—Beetham, United States
1:51.3—Kane, United States

1,500 Metres

3 min. 47.9 sec.—Mehl, United States
3:48.0—Cunningham, United States
3:48.8—Hagg, Sweden; Kalarne, Sweden
3:49.0—Andersson, Sweden; Jonsson, Sweden

One Mile

4 min. 08.3 sec.—Fenske, United States
4:10.1—B. Rideout, United States
4:11.0—Munski, United States
4:11.5—Moore, United States
4:11.6—Zamperini, United States

3,000 Metres

8 min. 09.0 sec.—Kalarne, Sweden
8:11.8—Hagg, Sweden
8:15.2—Tuominen, Finland
8:18.9—Rice, United States
8:19.6—L. Nillson, Sweden

Two Miles

9 min. 01.8 sec.—Mehl, United States
9:02.4—Rice, United States
9:12.5—Garner, United States
9:17.1—Holderman, United States
9:18.4—Neidnig, United States

5,000 Metres

14 min. 20.6 sec.—Hellstrom, Sweden
14:21.2—Pekuri, Finland
14:22.4—Tuominen, Finland
14:23.0—Kelen, Hungary
14:26.8—M. Jarvinen, Finland

10,000 Metres

30 min. 06.8 sec.—Syring, Germany
30:27.4—Beviacqua, Italy
30:33.8—Szilagyi, Hungary
30:40.0—Kelen, Hungary
30:37.8—Tuominen, Finland

110-Metre Hurdles

13.9 sec.—Wolcott, United States
14.0—Lidman, Sweden
14.2—Dugger, United States
14.3—Batiste, United States
14.4—Lavery, South Africa

200-Metre Hurdles

22.6 sec.—Wolcott, United States
22.8—Batiste, United States
23.0—Dugger, United States
23.1—Farmer, United States; Farrow, U.S.

400-Metre Hurdles

51.6 sec.—McBain, United States
53.2—Storeskrubb, Finland
53.3—Cochrane, United States
53.8—March, United States
53.9—Larsson, Sweden

High Jump

6 ft. 9⅜ in.—Steers, United States
6.9⅜—Wilson, United States
6.8¼—Boydston, United States
6.7½—Akimo, Japan
6.7⅛—Horn, United States

Broad Jump

25 ft. 6⅜ in.—Turner, United States
25.1 9/16—Kin, Japan
25.1⅛—Brown, United States
25.0 —Robinson, United States
24.11⅛—Lacefield, United States

Pole Vault

15 ft. 1⅛ in.—Warmerdam, United States (World Record)
14.8 —Meadows, United States; Dills, U.S.
14.4½—G. Smith, United States
14.4¼—Ganslen, United States

Discus

170 ft. 4½ in.—Fox, United States
167.7½—Zagar, United States
167.4⅝—Blozis, United States
166.5¾—Harris, United States
166.0½—Horvath, Hungary

Shot

56 ft. 0½ in.—Blozis, United States (American Record)
55.3¾—Anderson, United States
54.6 —Trippe, Germany
53.9 —Kreek, Esthonia
53.4¾—Williams, United States

Javelin

248 ft. 0 15/16 in.—Mikkola, Finland
246.2⅞—M. Jarvinen, Finland
242.0 3/16—Nikkanen, Finland
239.5⅛—Autonon, Finland
233.8 —Rantaraara, Finland

Hammer

188 ft. 0¼ in.—Storch, Germany
183.10¾—Bennett, United States
182.6 7/16—Johnson, United States
182.5 —Lutz, Germany
181.9 —Veirila, Finland

Hop, Step and Jump

51 ft. 7¾ in.—Harada, Japan
51.5 5/16—Kin, Japan
50.11¾—Miller, Australia
50.2⅝—Brown, United States
49.11¼—Rajassaari, Finland

FRED WOLCOTT of Rice Institute, at the right, won the 120-yd. high hurdles of the Drake relays April 27, 1940, at Des Moines, Iowa. It was his third consecutive victory in the annual meet

CHARLES FENSKE (left) outdistanced the four other greatest milers of the track Feb. 24, 1940, at New York city to win the U.S. indoor championship. In the centre of the picture, taken on the 9th lap, is Glenn Cunningham, who finished fourth, and Lou Zamperini, who was third. Gene Venzke was second

U.S. championship track events indoors went back to the yardage basis (field events have always been measured by yards) after ten years of metric measurements. Outdoor A.A.U. title events continued with metres for track events.

New construction technique was being developed in building indoor tracks that make for faster performances. On the especially constructed large indoor track at Dartmouth college, Hanover, N.H., many new world marks were established. (Cunningham ran the 1 mi. there in 4 min. 4·4 sec. several years ago.) Eight new world marks turned in on the Dartmouth track were listed as such by the A.A.U., aside from other indoor marks made on normal tracks measuring 8 or 9 laps to the mile. Those Dartmouth records were: John Woodruff, 880 yd. in 1 min. 47·4 sec.; 800 m. in 1 min. 47 sec. James Herbert, 440 yd. in 48·4 sec.; 400 m. in 47·9 sec. John Borican, three-quarter mile in 3 min. 0·5 sec. New York university relay team, 880 yd. relay in 1 min. 27·7 sec.; 1-mi. and 1,600-m. relays in 3 min. 15 sec.

Princeton Meet.—The Princeton track meet in Palmer stadium, always the scene of stirring competition and new records, saw Fred Wolcott skip over the 220-yd. low hurdles in 22·5 sec. Another great collegian was Paul Moore, of Stanford, whose outdoor three-quarter-mile run in 2 min. 58·7 sec. clipped nearly 2 sec. off the official world mark set by Jules LaDoumegue, of France, in 1931; he also bettered the world mark of 2 min. 59·5 sec. by Sydney Wooderson, in London, in 1939. Another new outdoor mark was established by Rice during his victory over Taisto Maki, of Finland, in a 3,000-m. race, in Minneapolis, in 8 min. 18·9 sec., breaking the American record by 7·5 sec.

In college competition, Southern California's Trojans were again unbeatable, capturing the National Collegiate A.A. title. University of Michigan topped all opposition in the Big Ten conference by winning both the indoor and outdoor track and field titles. In I.C. 4-A competition, University of Pittsburgh took the outdoor title without winning a first place and New York university captured the team trophy indoors.

Women.—The efforts of women in track sports in the United States also continued on the uphill. The top annual fixture, the national A.A.U. championships, at Ocean City, N.J., drew entries from 11 states. The highest point scorer was the perennial veteran, Stella Walsh of the Polish Olympic Women's club, of Cleveland, winning 28 points by capturing the 200-m. race, the broad jump and second in the 100-m. dash. Jean Lane took both the 50- and the 100-m. dash.

Catherine Fellmuth, another double winner, was successful in the discus and 8-lb. shot.

Europe.—War called many of Europe's outstanding athletes to serve their respective countries. Sydney Wooderson put aside his uniform and broke the Scottish 1-mi. record, with a 4 min. 11-sec. performance. Another soldier-athlete, John Loaring, of Canada, won the 220- and 440-yd. runs and the broad jump at a meet at the Portsmouth naval base. August Milligan, British shot putter who lost his right arm in France, was learning to toss the shot with his left hand. Oxford boasts of an outstanding freshman broad jumper, John Morrish, who did 24 ft. in practice after his 23 ft. 2 in. in the Oxford-Cambridge meet.

In the triangular track meet between teams from Finland, Germany and Sweden, held in the new stadium at Helsingfors, built for the 1940 Olympics, Sweden gained 147 points against Germany's 141 and Finland's 134. The Swedes took first places in the runs above 1,500 m., the Germans won the short distances and the Finns captured the jumps. About 115,000 people attended the two-day meet.

Canada.—The Canadian National exhibition attracted 50,000 people for two track meets during the Labor day week end in which many Americans competed. Tom Flagg won a notable "double" sprint and Joe McCluskey, of New York, was nosed out by a yard by handicap men in the two feature events. Jim Gable, of the R.A.F., won the 1-mi. walk. Miss Stella Walsh scampered to four easy victories over Canadian women. Gerald Cote, Canada's great marathon runner, was awarded the dominion medal for being the outstanding athlete of 1940. (J. B. P.)

Trackless Trolleys: *see* ELECTRIC TRANSPORTATION.
Tractors: *see* FARM MACHINERY.

Trade Agreements.

On April 12, 1940, President Roosevelt signed an act of congress extending for a period of three years from June 12, 1940, the authority to enter into trade agreements with foreign countries. By the beginning of 1940 trade agreements had been concluded with 21 countries; namely, the United Kingdom (including Newfoundland and the non-self-governing colonies), Canada, Belgium, Sweden, the Netherlands, Switzerland, France, Finland, Czechoslovakia, Turkey, Cuba, Haiti, Brazil, Honduras, Colombia, Guatemala, Nicaragua, Costa Rica, El Salvador, Ecuador and Venezuela. The proportion of total United States trade which was conducted with trade agreement countries in 1939 is indicated in the chart on next page.

In view of the fact that the trade of the United States and of the areas covered by the United States trade agreements constitutes more than 60% of the foreign trade of the world, it is evident that the U.S. program, built upon the principle of lowered trade barriers and non-discrimination, and designed to counter the crippling and provocative trade practices which followed the economic crash of 1929, has proved practical and effective.

The United States trade agreements program grew out of the conditions and needs resulting from the world depression following 1929. Nations had entered into feverish competition with each other to sell to foreigners a maximum and to buy from foreigners a minimum of goods. Trade barriers had been built up to unprecedented heights. To constantly mounting tariff walls were added entirely new economic devices for regulating trade—quota restrictions, exchange controls, government trade monopolies and export and import licensing requirements. The trade highways of the world became blocked with impassable barriers. International trade fell to a third of its 1929 value. From 1929 to 1933 the value of United States foreign trade fell from $9,640,000,000 to only $3,125,000,000. The resulting economic dislocations gave rise

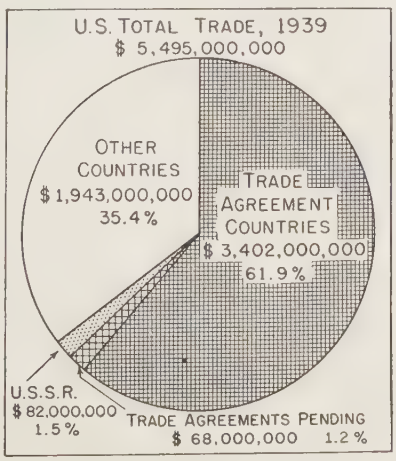
to widespread suffering and social unrest.

To meet this national emergency, legislation designed to increase foreign trade was worked out upon the basis of three principles of tariff making, each of which had been separately adopted heretofore in United States legislation, but which in combination were entirely new. The three principles are these: (1) Congressional delegation to the president of the power of tariff adjustment within prescribed limits. (2) Tariff negotiation by executive agreement. (3) Generalization of all tariff reductions (except those granted to Cuba) to the products of all countries which do not discriminate against U.S. commerce.

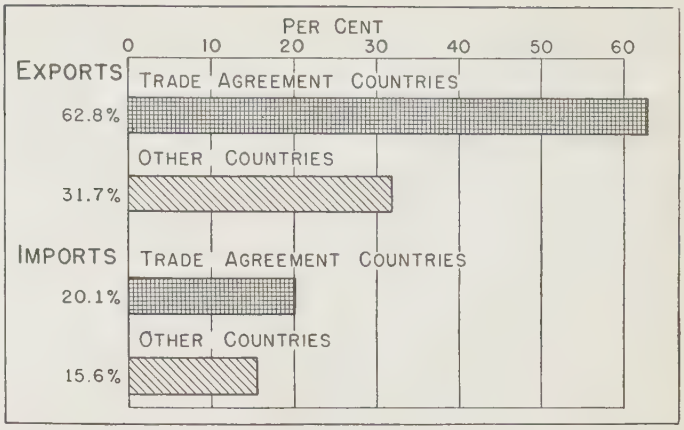
The Trade Agreements act, signed on June 12, 1934, offered a new program based upon these principles. The act authorized the president "for the purpose of expanding foreign markets for the products of the United States" (1) "to enter into foreign trade agreements" and (2) "to proclaim such modifications of existing duties . . . or such additional import restrictions, or such continuance . . . of existing customs or excise treatment of any article covered by trade agreements, as are required or appropriate to carry out" such agreements. The president may not modify existing customs duties beyond 50% nor may he transfer any article between the dutiable and the free lists. The duties thus proclaimed by the president are made applicable to the products of all countries, except that the president may suspend their application to the products of any country "because of its discriminatory treatment of U.S. commerce or because of other acts or policies" which tend to defeat the purposes of the act. The exceptional situation of Cuba is recognized by a provision for an exclusive preferential agreement with Cuba, thus continuing the preferential relationship established by the Commercial Convention of 1902.

The trade agreements program, designed to combat existing world tendencies toward economic nationalism, has a two-fold objective. It seeks, first, the reduction or elimination of excessive trade barriers. Trade barriers such as impede international commerce cause diminished national incomes, depressed standards of living, increased unemployment, financial instability and social unrest. The second objective of the program is the elimination of trade discriminations. Trade discriminations lead to constantly shifting trade currents, commercial uncertainty and insecurity, recriminations and retaliations, trade conflict and the kind of economic tensions that lead to war.

The success of the program was marked. Concessions—including duty reductions, quota increases and bindings of existing customs treatment—have been obtained in trade agreements on about three-fourths of the total agricultural imports and on about one-half of the nonagricultural imports of the trade agreement countries from the United States. For all products combined, agreement countries have granted concessions on nearly 56% of their imports from the United States.



Because of the disruptive effects of the war in Europe and hostilities elsewhere, it would be difficult, if not impossible, to measure statistically the effects of the trade agreements program in 1940. However, the influence of the program in stimulating the foreign trade of the United States is indicated in the chart above, which shows the increase during the two-year period of 1938 and 1939 over the two-year period of 1934 and 1935 of exports to, and imports from, trade agreement countries as compared with other countries.



INCREASE IN UNITED STATES EXPORTS AND IMPORTS under the trade-agreements program. The chart shows increase of 1938 and 1939 (average) over 1934 and 1935 (average). Trade with Ecuador, the British agreement area, Venezuela and Turkey is not included, since agreements with them were not in effect during all of 1938 and 1939

Armed conflict in progress in other parts of the world in 1940 confronted the United States with many serious and difficult problems, not the least of which were the dislocations suffered by international trade and finance. As a result of these maladjustments growing out of foreign wars, the maintenance of the liberal trade principles of the trade agreements program became an important factor in the national defence program of the United States.

(*See* also INTERNATIONAL TRADE; TARIFFS.) (H. F. G.)

Trade Unions: *see* LABOUR UNIONS.

Traffic Accidents.

Motor vehicle accidents took a toll of 34,400 lives in the U.S. during 1940. This was 2,000 more than in 1939—a 6% increase. The fatality increase was paralleled by a corresponding rise of 6% in motor vehicle travel. The death rate on a mileage basis therefore remained unchanged. During both years twelve persons lost their lives for every 100,000,000 vehicle miles travelled.

The 6% increase in total traffic deaths was attributed to four causes. They were: (1) Increased exposure. In addition to a 6% increase in mileage, the number of vehicles in use increased 4%. (2) Loss of trained traffic control personnel through selective service and defence industry demands, accompanied by some shift of official attention from traffic. (3) Psychology of the war situation on both officials and the public. (4) An economic upswing accompanied by increased use of intoxicants.

Outstanding achievements in the field for 1940 may be grouped under the headings of the model highway safety program which was drafted and endorsed by 12 leading organizations interested in safety in the United States.

Legislation.—Continued adoption by cities of the Model Municipal Traffic Ordinance as drafted by the National Conference on Street and Highway Safety; drafting of bills in many states for submission to 1941 legislatures seeking improved traffic laws in conformance with the uniform vehicle code.

Motor Vehicle Administration.—Improvement in motor vehicle administration in states with more adequate accident reporting systems, a better examination for new drivers, more efficient suspension and revocation of drivers' licences for cause and renewed efforts to cancel "good until revoked" operators' licences and replace them with definite term licences.

Enforcement.—Broader use of standard procedures and techniques in traffic law enforcement and accident investigation together with a general increase in traffic police personnel; improved and more uniform traffic court procedures and practices; completion of studies by the national committee on traffic law enforcement seeking to raise the general level of traffic court procedures and police procedures in traffic law enforcement.

The traffic court report was adopted by the American Bar association and the police report by the International Association of Chiefs of Police.

Education.—Co-operation of 73 colleges and universities in conducting academic credit courses in safety education during the summer of 1940; increases in driver training courses offered in high schools with 7,800 schools offering classroom courses, 300 of which were supplemented by actual road lessons; inclusion of approximately 310,000 children in grade school safety patrols in 3,250 cities and towns; increase in number and scope of community safety organizations and continued improvement and expansion in the field of adult safety education.

Training Personnel.—A pronounced increase in the training of traffic safety engineers, educators and enforcement personnel during 1940; continued co-operation of universities and safety organizations in conducting effective training programs; development and expansion of departmental training schools for field personnel of state and municipal police agencies. Principal training agency for traffic engineers was the Yale University Bureau for Street Traffic Research; for educators, the New York University Center for Safety Education; for traffic police, the Northwestern University Traffic institute.

Engineering.—A distinct trend toward more and better traffic engineering. A majority of state highway departments, together with an increased number of cities, employed qualified traffic engineers.

BIBLIOGRAPHY.—American Automobile association, *Driver Education and Training Manual for High School Teachers;* Northwestern University Traffic institute and the International Association of Chiefs of Police, *Accident Investigation Manual* and *The State and Provincial Police;* National Safety Council committee reports dealing with intoxication, night driving, winter driving hazards, speed, pedestrian control and the bicycle problem.

(F. M. K.)

Trailer Travel.

With sales indicated at approximately $18,000,000 during 1940, a great increase in the use of automobile trailer coaches was taking place. During the year new and enlarged plants were erected and engaged to meet the growing demand for trailer coaches. The present national defence program, involving the establishment of many new munitions-making factories in locations remote from housing facilities, made the trailer coach an important factor in quickly supplying temporary living quarters for workers.

Science and industry, too, have found the trailer coach to be useful for many purposes. For salesmen who carry lines too heavy to transport by auto, or products which can best be demonstrated "on the job," the trailer coach was growing in popularity. Rural hospitals, dental and medical clinics, branch and travelling libraries, mobile X-ray laboratories and photographic studios are a few of the uses to which they have been put.

The U.S. government was using trailer coaches in an ever-increasing amount—for recruiting offices, for radio and photographic work, for field hospitals, officers' headquarters and for many other purposes.

State governments also were drawing upon the industry for substantial numbers of trailer coaches for their highway and police departments and for other purposes. Employees and performers of circuses and carnivals, travelling musical organizations, etc., found in them an excellent mode of transportation and housing.

They continued to be popular, also, among vacationists and the large segment of retired people who spend their winters in the south and much of their summers in the north.

During 1940 there was a decided trend towards larger and better trailers, according to the Trailer Coach Manufacturers' association, which gathers production statistics from the principal manufacturers in the industry. Nearly 70% of the trailer coaches purchased during 1940 ranged in price between $700 and $1,200. More than 90% of those made were from 17 to 24 ft. in length—the larger portion being towards the longer length. One of the noticeable trends in 1940 was the shift to air-conditioning, improved ventilation and insulation, and finer construction throughout. Mechanical refrigeration was rapidly increasing in popularity through the availability of an increasing number of trailer parks throughout the country, where full utility services were made available to the trailer dweller on his stops. While no definite data are available, well informed opinion estimates that in 1940 there were approximately 300,000 trailer coaches in use for commercial, government, pleasure and temporary housing purposes. (P. E.)

Trans-Jordan.

Trans-Jordan lies to the east of Palestine and is bounded on the north by Syria, on the northeast by Iraq, on the southeast and south by Saudi Arabia. It is an Arab principality which forms part of the British-mandated territory of Palestine. Like the land west of the Jordan, it is under the supervision of the British high commissioner for Palestine and Trans-Jordan, Sir Harold MacMichael, but it is ruled by a native prince, Emir Abdallah Ibn Hussein, and has a constitution providing for a council of ministers under Tawfiq Pasha Abdul Huda as premier and an elected legislative assembly. Although the country is three times as large as Palestine west of the Jordan, and covers an area of 34,740 sq.mi., it has a population estimated at only 350,000. Most of the people are Arabs, but there is a minority of Circassians. The religion of the inhabitants is Mohammedan, except for about 25,000 Christian Arabs, mostly Greek Orthodox and living in the town of Es-Salt. The capital is Amman (the ancient Rabbat Ammon and in Hellenistic times called Philadelphia), which has lately been transformed into a modern city and counts about 25,000 inhabitants.

During the year 1940 the attention of the government was centred on furthering the development of the country by settling the largely semi-nomadic tribes and by improving agricultural methods, and on strengthening defence forces which gained a new importance in view of unsettled conditions in the near east as a result of the European war. Emir Abdallah and the government of Trans-Jordan remained loyal to Great Britain and the resources of the country were put at the disposal of the defence of the near and middle east. No actual warlike operations disturbed the country, but the population followed closely the events in the neighbouring countries of Palestine and Syria. Emir Abdallah was known to harbour plans for the unification of these countries under his leadership, but no change could be contemplated so long as military operations were still continuing and the outcome of the war remained uncertain. (H. Ko.)

Transylvania: *see* HUNGARY; MINORITIES; RUMANIA.

Trap-shooting.

There were in 1940 nearly 1,000,000 shooters in the United States who spent an average of $50 during the year for shells and accessories, not counting the cost of guns, a total of $50,000,000. The big event of the year was the Grand American championships at Vandalia, O., attended by more than 1,000 of the leading shooters. A new champion was crowned in 1940, E. H. Wolfe, of Charleston, W.Va., who broke 98 clay birds out of 100, from the 23-yd. mark. The champion

of champions title was the reward of the marksmanship shown by Samuel Sharman, of Salt Lake City, Utah.

The North American title was won by Forest McNier, of Houston, Tex. and the class A.A. was admirably won by H. G. Albritt, of Excelsior, Minn. H. L. Cheek, of Clinton, O., took the all-around amateur championship, breaking 1,131 out of 1,200 disks, while C. C. Mitchell won the corresponding professional title with 1,137 "birds." Mrs. Lela Hall, of Strasburg, Mo., again proved her right to the women's trap-shooting title with 95x100 from 22 yd. Fred Tomlinson, of Glassboro, N.J., was the new professional champion.

Walter S. Beaver, of Conshohocken, Pa., was the outstanding figure in the national amateur championship three-day shoot at the New York Athletic club's traps at Travers island, when he took the doubles title with 92x100 birds; tied for the national singles title the following day with 197x200, but lost to D. Franklin Beck, of Havre de Grace, in the shoot-off; and in the distance handicap championship on the third day, shooting as scratch man from the 25-yd. mark, broke 95x100, only one less than the winner, Merton J. Cushman, of the New York A.C., from the 19-yd. line.

Of the several leading annual tournaments, the Atlantic Indians championship drew the spotlight because of the two-gun duel between L. G. Dana and Thomas Young for class A title. It was finally won by Dana with 200 "kills" in a row. Roger Fawcett won the 16-yd. crown, Tom Marshall captured the doubles event and Harry E. Brown shot his way to victory in the class championship events.

Joe Hiestand won the marathon race at the 20th annual T. Clarence Marshall trap-shooting tourney at Yorklyn, Del., scoring 498x500; H. C. Jones won the Brandywine title with 200 straight; H. P. Messler took the Special, 150x150; Elbert Mount won the T. Clarence Marshall handicap, 145x150. There were 450 shooters who used 130 clay birds and an equal number of shells during this four-day shoot. (J. B. P.)

Trinidad: *see* West Indies, British.

Trotha, Adolf Lebrecht von (1868–1940), German vice-admiral, was born March 1 in Coblenz and was graduated from the German naval academy in 1900. He served in China during the Boxer uprising. In 1916 he was chief of staff of Admiral Scheer during the battle of Jutland. From March 1919 to Sept. 1920 he was chief of the German admiralty. In the latter year he took part in the Kapp "putsch" and was dismissed from the service. He wrote several books on naval strategy as well as a life of Admiral von Tirpitz. He died in Berlin on Oct. 11.

Trotsky, Lev Davidovich (1879–1940), Russian politician, was born near Elizavetgrad, Russia. For his biography, see *Encyclopædia Britannica,* vol. 22, p. 497. After taking refuge in Mexico in 1937, he lived for a time with Diego Rivera, the Mexican artist, but disagreed with him and took a house in the suburbs of Mexico City. An attempt on his life was made May 24, 1940, and the assailants escaped. Another attack was made on August 20 by a man whom Trotsky described as an agent of the Russian OGPU. His injuries were so serious that he died the next day.

Trucial Sheikhs: *see* Arabia.

Truck Farming. Fourteen principal commercial truck crops showed an increase in acreage planted for fall and winter harvest, for the 1941 season, of 16% over the 1940 season and 17% larger than the 1930–39 average. Truck crop planting during 1940, both for summer and for fall and winter harvest, marked an upward trend in acreage after three years of decline ending in a low in 1939. Truck farming in the U.S., the department of agriculture points out, normally follows a five-year cycle consisting of three years of declining acreage followed by two years of increased acreage. The combined pack of the important truck crops grown for canning in 1940 was estimated by the department of agriculture as 103,000,000 cases of 24 no. 2 cans to the case, compared to 94,900,000 cases in 1939. The carry-over from 1939 was about 11,500,000 cases, or less than one-half of the carry-over from 1938, leaving, with the 1940 pack, a supply of approximately 115,000,000 cases compared to 120,100,000 cases in 1939. There was an unusually large pack of peas in 1940, about 25,500,000 cases. Per capita consumption of canned vegetables in the United States has increased from 14 lb. in the five-year period of 1920–24 to about 22 lb. in 1940. This does not include frozen vegetables or cucumbers and cabbage processed as pickles and kraut or tomatoes in sauces and soups. Of these also there has been a large increase in consumption during the same period. Nor does it include consumption of fresh vegetables which also has increased. (*See* Market Gardening.) The table shows the per capita increase in the consumption of canned vegetables in the United States in two different periods (1920–24 and 1935–39) as shown by the department of agriculture. (S. O. R.)

Per Capita Consumption of Canned Vegetables in U.S.

	1920–24 lb.	1935–39 lb.
Asparagus	0.38	0.48
Beans (snap)	0.72	1.76
Beets	0.23	0.63
Corn	3.60	3.98
Peas	3.06	4.66
Pumpkin and squash*	0.36	0.40
Spinach	0.48	0.88
Tomatoes	5.10	5.72
Tomato pulp and juice	0.59	3.33

*1925–29

Trucks: *see* Motor Transportation; Motor Vehicles.

Tuberculosis. **Diagnosis.**—The accuracy of the tuberculin test was again confirmed by Musacchio (Detroit) on 1,000 patients in a hospital for the tuberculous; 97% reacted to the test. The tuberculosis committee of the American School Health association urged that it be the first step in the detection of tuberculosis among school children and personnel of all schools. The tuberculosis committee of the American Student Health association made a similar recommendation. Both organizations regard the intracutaneous method of Mantoux as the standard procedure.

The number of children infected with tubercle bacilli is definitely decreasing. For example, Jordan (Minnesota) tested school children about 1930 and found 14% reacted, whereas, in the same areas in 1940, 6·7% reacted.

During the school years 1938 and 1939, the tuberculosis committee of the American Student Health association reported that 82,774 students in various parts of the United States were tested and 25·5% reacted.

Several methods of making X-ray inspections of the chest were used during 1940. J. Rodriguez Pastor (Puerto Rico) found the fluoroscope of value. Potter (Chicago) and Douglas (Detroit) did X-ray inspections of the chests of 1,610 persons with standard size X-ray films (14x17 in.) and also with miniature films (4x5 in.). The miniature film revealed evidence of disease in 2·6% less than the standard size film. In a test for speed, they exposed the chests of 73 persons in 65 min. Roentgenphotography (35 mm. films) was also employed in various parts of the world.

Clinical and Special Examinations.—Koganas *et al.* (Lithuania) improved the method of examining stomach washings for tubercle bacilli, which materially shortens the time required to determine whether tubercle bacilli are present.

Rosencrantz *et al.* (California) studied stomach washings of 169 children who reacted to tuberculin by inoculating guinea-pigs. In 76 cases the animals developed tuberculosis. These children had tuberculosis in various forms; in fact, bacilli were found in seven with calcified lesions in the lungs and in six in whom no disease could be found in the lungs but was present in other parts of the body. This method of examination has been used extensively.

Lester (Copenhagen) again called attention to bacilli which have the same staining qualities and appear precisely the same under the microscope as tubercle bacilli. She points out the danger of making a diagnosis until it has been determined whether the organisms produce disease in inoculated animals.

Mass Examinations and Special Groups.—In Canada, all war recruits have X-ray film inspection of the chest. Adamson (Winnipeg) and Jones (Ottawa) reported that about 1% have been eliminated from service because of tuberculosis. Berner (Frankfurt-on-Main) made X-ray inspections of the chests of 640,000 citizens of Mecklenburg. He found suspected tuberculosis in 1·25%. Bentley and Leitner (London) pointed out that in the countries at war, such as France, Belgium and Germany, large numbers were examined and approximately 1% were found with shadows due to tuberculosis.

Provisions were being made in 1940 for examinations of the chests of all persons entering the army and navy of the United States. During and since the World War of 1914–18, tuberculosis among men who were in service has cost the United States approximately $1,000,000,000 and other countries have suffered proportionate losses.

In the state of New Jersey a law was effective in 1940 which required adequate examinations for tuberculosis of the personnel of the entire school system as well as all students of high school age. Already this has brought to light cases of unsuspected tuberculosis.

Pollak (Jersey City, N.J.) reported the incidence of tuberculosis among nurses so high that he concluded wherever patients with communicable tuberculosis are treated, strict contagious disease technique should be employed to protect nurses. He recommended that all students and graduate nurses be examined with tuberculin and the reactors have periodic X-ray film inspection of the chest.

Ferguson (Saskatchewan) reported an incidence of tuberculosis among student nurses of 1·44% per annum as compared with an incidence of ·15% among women of the same age in the general population of Saskatchewan.

Davies (Port of Barry, Wales) found a high incidence of tuberculosis among seafarers. It occurred among those on vessels both in temperate and tropical climates.

Wohlhueter-de Loriol (Strasbourg) found an alarming number of seamstresses with tuberculosis; in fact, among 500, 90 had active tuberculosis. He believes the dust produced by the manipulation of tissues and especially the siliceous elements used in finishing materials is an important factor and that the silica increased the proliferation of tubercle bacilli.

Treatment.—Sulphanilamide and sulphapyridine, so effective in such diseases as gonorrhoea and pneumonia, have been found by Reimann (Philadelphia) and Follis *et al.* (Baltimore) to inhibit the development of tuberculosis in laboratory animals. Corper (Denver) believed the apparent inhibitory effect in experimental animals to be due to the toxicity of the drugs rather than any specific action and, therefore, they should not be used in cases of tuberculosis except for co-existing diseases for which they have been found of definite value.

Sulphathiazole has been found to have little or no effect on the course of tuberculosis in guinea-pigs. No one has yet reported any of these drugs as having a significantly beneficial effect on tuberculosis in man.

Prognosis.—Johnston *et al.* (Detroit) removed 838 children who reacted to tuberculin from contact with tuberculosis in their homes and followed them in boarding homes over varying periods up to 12 years. Twenty-three developed clinical tuberculosis after contact was broken. Sartwell (Boston) pointed out the dangers of infected children developing clinical tuberculosis in adult life and emphasized the importance of periodic examinations.

The mortality from tuberculosis in the United States was 46 per 100,000 in 1939; it was 79 in 1928 and 202 in 1904.

Prevention.—Marked advances have been made in the protection of members of hospital personnel against tuberculosis. Harrington *et al.* (Minneapolis) by using strict contagious disease technique definitely reduced the number of infections of students of nursing.

Tytler *et al.* (Cardiff, Wales) concluded that contaminated books are a serious problem and should be sterilized by dry heat. Cheap, soiled books which have been much exposed to tuberculous patients should be destroyed.

Hall (New Rochelle, N.Y.) called attention to the dangers of children becoming infected with tubercle bacilli through contact with tuberculous servants and teachers. He strongly recommended periodic examinations of all such persons.

Collins (New Brunswick) emphasized the importance of the care of tuberculous patients after their disease comes under control, with particular reference to rehabilitating them. Hochhauser (New York) recommended that sheltered workshops be provided for tuberculous patients whose disease is brought under control.

Young and Faber (Tyler, Texas) called attention to the problem of tuberculosis in athletes and strongly recommended that all high schools and colleges provide adequate examination of athletes to detect symptomless, clinical tuberculosis.

Spector (St. Louis) found that when tuberculosis in the contagious stage develops in a husband or a wife, the risk of the consort is 29 times greater than for persons in the general population.

Lee (Shanghai), on the basis of tuberculosis mortality rates in China, estimated that there are approximately 1,200,000 deaths annually in that country and 12,000,000 persons who have the disease in clinical form at all times.

The committee of the American Student Health Service association was not convinced that vaccination with BCG is a satisfactory method of protecting students against tuberculosis.

Tuberculosis in Animals.—Feldman (Rochester, Minn.) found tuberculosis in 75 of 264 garbage-fed hogs. In 47 he typed the tubercle bacilli and found that 35 had the avian type of disease and 12 the human type. He strongly recommended that unselected garbage should not be fed to swine in an uncooked state.

Hedvall (Lund, Sweden) reported 65 cases of tuberculosis in man which had been contracted from cattle. He found that the bovine type of tuberculosis in man does not differ from that produced by the human type of tubercle bacillus.

Ichok (Paris) studied tuberculosis in rural areas and found an exceptionally high incidence among young women but a low incidence among middle-aged men. Because of the consumption of raw milk the bovine type of tubercle bacillus played a greater part in the spread of disease in rural areas than in towns.

On Nov. 1, 1940, it was announced that all the counties in the United States had been rated as modified accredited with reference to tuberculosis in cattle. This is the world's most outstanding accomplishment in tuberculosis control. When a well organized program began in 1917, tuberculosis among cattle was a serious disease not only because of the economic loss but also because it was transmissible to man. In the 23 years required to accredit all U.S. counties, more than 230,000,000 tuberculin tests were administered to cattle and almost 4,000,000 reactors were slaughtered and examined at post-mortem. From this extensive experience the veterinarians and their allies were convinced that the tuberculin test is more than 97% efficient.

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(J. A. MY.)

Tungsten. The world's tungsten producing industry centres mostly in southeastern Asia, whence came 65% of the 1939 total, estimated at 41,000 metric tons of concentrates (60% WO_3 basis), a 10% increase over 1938; 28% of this total came from China, 24% from Burma, 3% from Malaya and 8% from other adjacent territories, chiefly Chosen. Of production elsewhere, the United States supplied 10%, Bolivia 8%, Argentina 3% and Portugal 9%; other outputs are small and widely scattered.

Due to the disturbances incident to the Japanese invasion of China, the Chinese exports for 1939 dropped 35% below those of 1937 and early reports for 1940 were at a still lower level, mostly through Indo-China. Exports from Burma during the first half of 1940 were somewhat below the 1939 average, but Argentina during the first ten months held to the 1939 level.

The United States industry is very erratic, and in spite of exceptionally heavy tariff protection is more or less at the mercy of world prices; production has been increasing, however, since the depression low in 1932, reaching 3,889 metric tons in 1939. In addition to the domestic output in 1939, the U.S. imported for consumption about 1,400 metric tons of concentrates (60% basis), 560 tons for smelting and export, and small amounts of metal, alloys and compounds. In addition, ore imported and stocked in bond amounted to 1,550 tons. Imports were radically increased in 1940, the 60% equivalent of imports for consumption for the first ten months being 3,950 tons and imports for smelting

and export, 1,280 tons.

The British empire controlled 32% of the 1939 world output, in Burma, Malaya, Australia, southern Africa and Cornwall.

Germany is the largest consumer of tungsten, with imports of 15,400 metric tons (60% basis) in 1938 and 6,200 tons in the first half of 1939. War conditions may be expected to increase the demand for tungsten in appreciable amounts. (*See* also MINERAL AND METAL PRICES AND PRODUCTION.) (G. A. Ro.)

Tunis: *see* FRENCH COLONIAL EMPIRE.

Tunnels. The year 1940 produced much activity and diversity of tunnelling conditions and design in earth and rock with and without stabilization of "soft" earth by use of low compressed air in workings to facilitate mining operations. The U.S. health service and the U.S. bureau of mines instituted an experiment in 1939 in the tunnel construction works of the New York city Queens-Midtown tunnel in the attempt to minimize compressed air illness by equipping the workers with masks and containers of pure oxygen during the process of exit from tunnel workings, otherwise known as the stage of decompression. No practical conclusions on this experiment were available in 1940, but with improvements since 1905, the work was highly successful in protection of the health of compressed air workers. This facility was opened to the public on Nov. 15, 1940. It is an exceptionally good example of lighting a highway in tunnel.

The city of Chicago, Ill., presented the most outstanding and delicate example of tunnelling under compressed air in the construction of its passenger transit subway system of almost eight miles of double track tunnels. Very good progress was made during 1940. The double track twin arched rectangular portions between stations, in length about four and one-half miles, were completed and were mined with the use of steel "liner" plates. On the large station tunnel sections good progress was made with the use of shields despite certain hazardous conditions, including removal of the old freight tunnel in the path of the new. Also in Chicago about two miles of 16 ft. diameter water tunnel was completed to serve Chicago's south side water filtration plant.

New York city completed the independent subway's Sixth avenue extension from Ninth street to 53rd street and opened it to the public on Dec. 15, 1940. This work involved very complicated operations in compressed air mining, underpinning and rock excavation in the immediate vicinity of other important structures.

In London, where practically all of the underground railway system is situated in London clay at great depth below street surface, the construction of certain authorized extensions were discontinued about the beginning of the year owing to the war, but not until a radical departure in construction of these tunnels had been tried. Owing to difficulty in obtaining cast iron lining, it was decided to build these circular tunnels with segments of ferro-concrete. The flanges and webs were of dimensions suitable for Portland cement concrete and were bolted together in the usual manner through holes formed by steel tubing in the flanges. Construction by this means proved satisfactory and the cost was considerably less than usual. In this respect it should be borne in mind that, in general, London clay, though it can behave badly under exposure to the air, is practically free of water. The promotion of the great system of deep underground railroad tunnels under London did not contemplate its use as an air-raid shelter. When the first unit of this system was opened to the public in Oct. 1890, the aeroplane had not begun to fly. Nevertheless, the many stations and foot passages connected with this passenger transit system in 1940 gave full protection against bombs dropped from aeroplanes. They are many miles in extent. The construction of highway tunnels in London under the river

SECOND LONGEST of the Pittsburgh-Harrisburg turnpike's seven tunnels is Allegheny tunnel—6,070 ft. in length. This superhighway in Pennsylvania was opened to traffic Oct. 1, 1940

Thames from Purfleet to Dartford, about 20 mi. downstream from London bridge, remained dormant because of the war.

Sunken tunnels are passages under waterways constructed by excavating a trench and sinking in place pre-fabricated sections end to end. They constitute an alternative to actual tunnelling. At Mobile, Ala., a highway tunnel of this character was completed, but was by Jan. 1, 1941, not yet in operation. Also at Rotterdam, Holland, under the river Maas, a trench tunnel was well under construction when stopped by the war. This has a capacious under-river cross-section, about 82 ft. wide by 30 ft. deep, providing two vehicle highways, cyclist and pedestrian passages, all four independent of each other. The construction operations were well and ingeniously planned.

In the sphere of rock tunnelling much was done in the United States. The city of New York's Delaware aqueduct water supply tunnels, in length about 85 mi., were progressing rapidly. The southern half of this system was well toward completion. The northern half will be completed by 1942.

The Pennsylvania turnpike tunnels through the Allegheny mountains between Harrisburg and Pittsburgh were completed and form an example of very high speed work. This 160-mi. highway with its seven miles of tunnels, was opened to the public on Oct. 1, 1940. (J. Fe.)

Turkestan, Chinese: *see* SIN KIANG.

Turkey, a republic in southeastern Europe and western Asia, has an area of 296,500 sq.mi. and a population of about 18,000,000. The population is predominantly Turkish, with a considerable minority of Kurds in the eastern provinces; the religion is Mohammedan. The capital is Ankara in Anatolia, with 125,000 inhabitants; the two largest cities and ports are Istanbul with 700,000 and Izmir with 175,000 inhabitants.

Turkey, which before the World War of 1914–18 had been the centre of the Ottoman empire, was completely reorganized along modern and progressive lines after 1923 by Mustafa Kemal, who was president of the Turkish republic until his death in the fall of 1938, when his collaborator of many years, General Ismet Inönü, was elected president and followed generally the lines laid down by his predecessor, under whom Turkey had followed a consistent policy of peace and reconstruction. It had concluded an alliance with its old adversary, Greece, and had built up the Balkan Entente with Greece, Yugoslavia and Rumania, on the one

hand, and the near eastern pact with Iran and Iraq on the other, to find a firm basis for peace. Turkey had pursued a policy of close friendship with the soviet union, the heir of Turkey's most embittered enemy for 200 years, the Russian empire. With Germany's aggressive policy in 1939, Turkey found its system of peace endangered. It was especially afraid of a long-threatened attack by Italy on Anatolia, which the fascist power had prepared by the fortification of the Dodecanese islands lying just off the southwestern shores of Anatolia. Under these conditions Turkey concluded a treaty of mutual assistance with Great Britain and France on Oct. 19, 1939, in the event of war breaking out in the Mediterranean. Turkey, however, stipulated in that treaty, the duration of which was fixed for 15 years, that its obligations would not hold if they involved Turkey in hostilities with the soviet union. Strengthened by this pact Turkey strove at the beginning of 1940 to organize the Balkan powers for concerted action against any aggressor, but Turkey's efforts failed, and the conference of the Balkan Entente at Belgrade in Feb. 1940 confined itself to vague generalities. Thus Turkey found itself thrown upon its own resources and its alliance with Great Britain. Great care was taken to put the army on a footing of the highest efficiency and to exercise a strict watchfulness against the many German experts and spies in the country. Several large-scale plots were discovered, and as a result the Turkish government dismissed and expelled a number of German nationals. A new trade treaty with Great Britain in Feb. 1940 was to increase the commercial exchanges of the two countries.

The situation changed for Turkey when Italy entered the war and, a few days later, when France surrendered. Turkey's attention centred immediately upon the neighbouring French-mandated territory of Syria, which Turkey did not wish under any circumstances to have fall into German or Italian hands, and so to become a menace in Turkey's rear. An agreement was concluded with Iraq about common measures for such an eventuality. The successful resistance of Great Britain to German attacks across the English channel, and even more the inability of Italy to make any headway in the Mediterranean against the British position, increased Turkey's determination to remain faithful to its British alliance and to defend its territories by arms against Germany or Italy, if the need should arise. In spite of the pressure brought to bear upon Turkey by Germany's ambassador in Ankara, Franz von Papen, all efforts to make Turkey accept Germany's "new order" proved of no avail. In spite of the uncertain character of the relations between the soviet union and Germany, Turkish leaders frequently expressed the conviction that they would count at least on the tacit approval of the soviet union in their determination to resist fascist aggression. This attitude was made irrevocably clear by the Turkish president in his speech to the Kurultay, the Turkish parliament, on Nov. 1, after Italy's invasion of Greece. He pointed out that Italy, under the flimsiest of pretexts, had invaded Greece in spite of the latter country's most strenuous efforts at neutrality, and drew therefrom the conclusion that neutrality did not offer any protection. Under these circumstances, Ismet Inönü stressed the solid and unbreakable bonds of alliance uniting his country with Great Britain. Turkish newspapers were frankly outspoken in their violent criticism of the fascist powers and in their sympathy for Great Britain and Greece. Though Turkey maintained formally its neutrality, it left no doubt that any threat to Greece from the rear, from Bulgaria or by a German army advancing through Bulgaria, might find Turkey ready to join the war. It was probably this Turkish stand which influenced Bulgaria not to join the axis in Nov. 1940, when its signature to the Berlin-Rome-Tokyo alliance had been expected. The approaching winter seemed to lessen the danger of immediate warfare in the Balkans, and the Greek victories over the Italians heartened and reassured the Turks, but at the same time they evoked fears of Germany's coming to the help of its defeated axis partner and trying to relieve the pressure upon Italy in Albania by an attack on Greece through Bulgaria. Under these circumstances Turkey entered the year 1941 in a state of pre-war preparedness, confident in the quality and courage of its army and in the support of its British ally.

TURKISH PLATOON on manoeuvres in 1940. On Oct. 11 an official broadcast from Ankara warned Germany that an Axis invasion would be met by "2,000,000 bayonets"

(*See* also BALKAN ENTENTE.)

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(H. Ko.)

Turkmen S. S. R.: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Turpin, Ben (1869–1940), U.S. comedian, was born in New Orleans, La., son of a confectionery store owner of French descent. His family moved to New York city when he was 7 years old. In his late 'teens his father gave him $100 and told him to start out for himself, but he lost it gambling the next day and, afraid to go home, went to Chicago. He could cross his eyes and found that he could amuse people with his antics. He decided to go on the stage and with a partner wrote a comedy skit which was successful in vaudeville. Turpin later was employed by Sam T. Jack and in the course of time he created the character of "Happy Hooligan," which he played for 17 years. He went to Hollywood and met Charlie Chaplin, who gave him a job in slapstick comedy. He played in the silent pictures with Mabel Normand, Roscoe Arbuckle and others. He died in Hollywood, July 1.

TVA: *see* TENNESSEE VALLEY AUTHORITY.

Tweedsmuir, FIRST BARON, OF ELSFIELD, (1875–1940), governor general of Canada, was born John Buchan in Perth, Scotland, Aug. 26. He was educated at Glasgow university and Brasenose college, Oxford, and after graduation was admitted to the bar. When he was appointed governor general and raised to the peerage in 1935 he was one of the best known men of letters in Great Britain with 40 or 50 books to his credit

including novels and histories. He died in Montreal, Feb. 11, where he had been taken for an operation after suffering a stroke in Ottawa. See *Encyclopædia Britannica,* vol. 4, p. 310.

Uganda: *see* British East Africa.
Ukrainian S. S. R.: *see* Union of Soviet Socialist Republics.

Ulmanis, Karl (1877–1940?), Latvian statesman, was born September 4, in Zemgale, a district of Courland that later became part of the Latvian republic. His death was reported in Aug. 1940, during the disorders that attended Latvia's absorption into the U.S.S.R. For a biographical sketch of Ulmanis, see *Encyclopædia Britannica,* vol. 22, p. 674.

Ulster: *see* Ireland, Northern.

Unemployment. The various nations in their reports to the International Labour office, as of Dec. 1939, reported better employment in 1939 than in 1938. Throughout the world the picture improved, particularly from the late spring of 1939 through the balance of the year. Preparations for war contributed appreciably to the acceleration of industrial activity both in Europe and in the countries which ship raw materials to Europe. The U.S. business recession of 1937–38 did not affect the rest of the world seriously in 1938. The 21% decline in manufacturing employment in the United States between the summer of 1937 and that of 1938 produced no counterpart in any other nation.

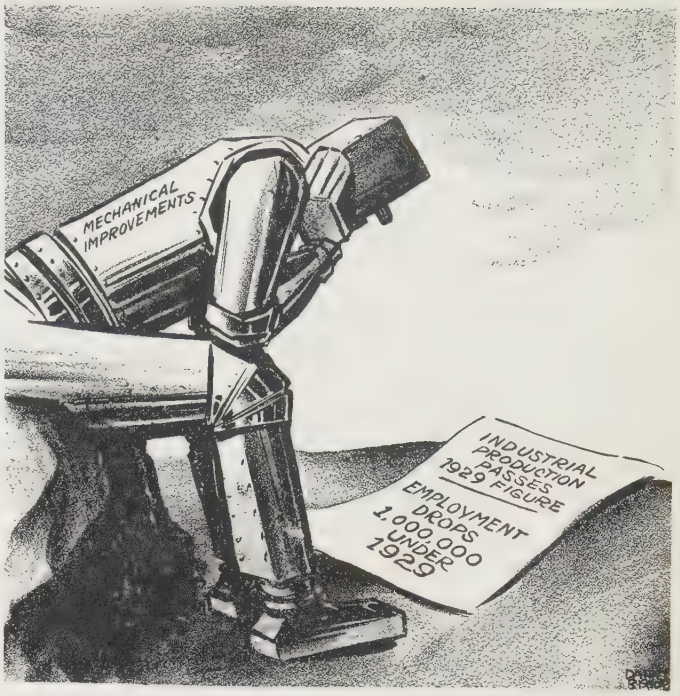
The improvement during the first two-thirds of 1939, as compared with 1938, was not large. The later months of the year, after war broke out, produced more rapid advances in employment. Germany (including Austria), Japan, Great Britain, France, Denmark, Norway, Switzerland and Yugoslavia, particularly, felt the "war boom" by early summer.

The unemployment statistics of many nations are distinctly unsatisfactory and conclusions drawn from them are open to suspicion. The available figures are of two principal kinds, each gathered in several different ways: statistics of employment; *i.e.,* of the number of people at work, and statistics of the number of people in need of work. Employment statistics are derived from "establishment" reports collected by mail or through field agents or labour inspectors. Unemployment statistics are furnished by the employment exchanges (applications for work), unemployment insurance systems (applications for benefits), unemployment relief records, reports of trade union secretaries and censuses of unemployment.

The various types of statistics agree reasonably well in their picture of what happened in the different countries, but not always upon the extent of the changes which occurred.

Great Britain and Northern Ireland have three-fourths or more of their wage earners (about 13,000,000) under unemployment insurance. Of these, 1,831,372 were wholly or temporarily out of work in Dec. 1938. In Dec. 1939 the number was 1,361,525 and then gradually declined to 880,822 by May 1940. By the middle of 1940 the war had reduced unemployment in Great Britain. The average number unemployed (wholly and by temporary stoppages) was 2,744,789 in 1932; 1,790,681 in 1938; 1,513,560 in 1939 and 1,199,545 during the first five months of 1940. These figures included only those insured, who were required by law to register at the employment exchanges. If the 4,750,000 not covered by the insurance act were included in the figures, the unemployment percentage would be more apt to fall than to increase, since military service, the police, civil service, teaching and other relatively stable occupations were in this group.

Registrations of unemployed persons at the employment offices



"IS THE CREATOR BEGINNING TO THINK?" asks Bishop of the *St. Louis Star-Times* in pondering the statistics of U.S. technological unemployment in 1940

of the Irish Free State increased fivefold from the pre-depression years to 1935. From January through April 1939 approximately 105,000 were registered each month; thereafter the registrants decreased rapidly to approximately 70,000 in the summer. Then the number of applicants rose considerably. It was 118,000 in Nov. 1939 and was close to that figure until Feb. 1940, when it began to decline. It was 83,000 in May 1940.

Unemployment remained at high levels in France during the first half of 1939. It had reached its peak in 1935–36. The decline during 1937 was small. Conditions got worse in 1938. The year 1939 began with unemployment nearly as bad as in 1935. But by August a third of the unemployed were back to work. The employment exchanges had 460,816 registered in January and 333,150 in August. In March 1940 the figure was 223,732.

The high unemployment figures which had obtained in the Netherlands since 1933 continued until March 1939. The winter of 1938–39 was very bad. From April improvement was rapid. There were 405,927 registered at the employment exchanges in Jan. 1939 and 297,874 in Jan. 1940. The percentage drawing unemployment insurance benefits decreased from 31·3% in Jan. 1939 to 19·3% in March 1940.

Belgium experienced marked improvement in 1937, but with worse conditions in 1938. The average number unemployed increased from 125,929 in 1937 to 195,211 in 1939. It was 163,598 in March 1940. Unemployment continued at high levels in Belgium during 1939 and early 1940. The figure was 241,336 in Jan. 1940. In 1931, by contrast, it was 110,000. In 1937 the insured workers of Belgium lost 13·1% of their possible working time; in 1938, 17·6%; in 1939, 18·8%; Jan. 1940, 20·5%.

Denmark, Norway and Sweden all experienced moderate improvement during the first eight months of 1939 following slightly worse unemployment in 1938 than in 1937. Denmark's percentage of trade unionists unemployed was 21·4% for 1938 and 18·4% for 1939. It was 32·9% in Feb. 1940; 20·3% in May and 16·3% in July. Norway's in 1938 was 22%; in 1939, 18·3% and Jan. 1940, 23·9%; Sweden's in 1938, 11·8% and in 1939, 10·0%. In Jan. 1940 it was 14·2% and dropped to 9·0% by June. In the summer of 1939 the Swedish figures approximated pre-depression

levels, averaging 6·5%, but in Denmark the summer average was 11·1% and Norway 13·5%.

The German census of 1933 recorded 32,300,000 people in the employable population, of whom 5,900,000 were unemployed. The average number of applicants at employment exchanges dropped from 912,312 in 1937 to an average of 284,132 in the first nine months of 1939. No 1940 figures were available. The percentage of the insured population idle reached minimum figures in 1939. After January, when it was 1·5%, it dropped steadily to ·2% in June and was below 5% all summer. This is below what is ordinarily considered "zero employment."

General Indexes of Factory Employment and Pay Rolls U.S.A.

Source: *Monthly Labor Review*

(1923–25 = 100)

Employment

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1929	101.7	104.1	105.4	106.7	106.5	106.8	107.3	109.2	110.3	109.0	104.6	100.7	106.0
1932	70.0	71.2	70.1	67.8	65.2	63.2	61.0	62.7	66.1	67.2	66.3	65.1	66.3
1936	92.1	92.2	93.4	94.7	95.4	95.9	97.1	99.9	101.9	103.2	103.3	104.4	97.8
1937	102.7	105.3	107.7	108.8	108.9	107.5	108.0	109.1	109.0	107.2	101.1	94.5	105.8
1938	87.8	88.2	87.7	85.7	83.4	81.6	81.9	85.7	88.8	88.5	90.5	91.2	86.8
1939	92.2	93.6	94.3	94.1	93.0	93.4	93.5	96.9	100.3	103.7	103.9	104.2	96.9
1940	101.5	101.5	100.9	99.7	99.1	99.6	99.7	103.8	107.7	110.1	..	..	..

Pay Rolls

Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1929	103.8	110.8	113.0	114.1	114.3	112.7	108.6	113.5	114.4	113.7	104.9	101.2	110.4
1932	54.0	55.4	53.6	49.6	46.8	43.7	40.4	41.4	44.0	45.8	43.6	42.4	46.7
1936	76.7	76.6	80.3	82.3	83.9	84.1	83.4	87.1	86.9	92.5	94.0	98.8	85.6
1937	94.4	99.7	105.5	109.3	109.7	107.0	104.6	108.2	104.4	104.5	92.9	84.2	102.0
1938	75.0	76.9	77.1	74.6	72.9	70.8	70.6	76.8	81.0	84.1	84.1	86.6	77.5
1939	83.7	86.0	87.6	85.5	85.0	86.5	84.4	89.8	93.9	101.7	101.7	103.9	90.8
1940	98.4	97.9	98.4	96.5	96.4	98.1	96.8	104.0	107.7	114.5	..	..	..

Switzerland's employment exchange figures are unusually reliable measures of unemployment because both the relief act of 1919 and the unemployment insurance law require applicants to register at the employment exchanges. From 1927 to 1929, 2·2% of the employable population were wholly unemployed and 1·6% partially. For practical purposes, this is zero unemployment in any country. In 1929 an average of 8,131 applicants registered at the employment offices (out of about 2,000,000 employables). In 1939 the average was 40,324. Month by month the registrations declined to a low of 23,670 in November. During the first seven months of 1940 the numbers unemployed were as low as in 1929—13,447 in March; 7,226 in May; 12,795 in July.

The Italian index of employment (1929=100) was down to 78·5 in 1932 and back to 94·9 in 1936; 104·5 in 1937 and 110·7 in 1938. The index for 1939 continued to move upward as a result of European wars. Taking into account the growth of population, these figures indicate employment in the reporting establishments approximating the 1929 level in the early summer of 1937. Statistics for Italy during 1940 were not available.

Czechoslovakia had very low unemployment in 1939. There were no figures for 1940. Applications at the employment exchanges averaged approximately 12,000 per month during the first half of 1939. The German seizure of the country made the figures for 1939 and 1940, if obtainable, non-comparable with earlier figures. Therefore no comparisons with earlier years are attempted.

Yugoslavian employment exchange statistics record an average of 22,517 registrants for work in 1938; 24,223 in 1939. Unemployment increased in the winter of 1939–40. There were 36,896 registered in Jan. 1940; 44,844 in February. The figures moved down to 19,058 in June.

The only Mexican figures on unemployment are "official estimates." The figure given for 1930 was 75,695; 1932, 339,378; 1938, 204,702; and the last six months of 1939, 177,223.

The general trend of employment in the United States and Canada was downward in the first half of 1938, with severe unemployment, particularly in the United States, until the spring of 1939. There was then steady improvement the balance of the year.

The Canadian employment index (1926=100) averaged 111·8 for 1938 and 113·9 for 1939. The index was at 108·1 in Jan. 1939 and rose to 122·7 in Dec. 1939. It rose steadily during the first ten months of 1940 to 136·2 in October. The employment exchanges carried average registrations of 103,739 during 1939 and 109,400 the first nine months of 1940. Estimated unemployment decreased from 352,000 in July 1939 to 238,000 in July 1940.

The United States took a special census of unemployment, Nov. 20, 1937, which recorded 7,822,912 as unemployed (2,001,877 of whom were employed on government relief work). This census was a voluntary report of individual citizens on forms left at all homes by the postal service. Sample tests made on 1,455 mail routes indicated that a 100% return might have shown as many as 10,800,000 idle on November 20. A half million workers were laid off in Nov.–Dec. 1937. Comparing these figures with the 13,500,000 to 14,500,000 idle in 1932–33, the 1937 unemployment figure was discouragingly large.

Previous to 1930 the United States economic system expanded each decade rapidly enough to absorb the growth of population. During the '30s economic growth failed to keep pace with the growth of labour supply. The unemployment of 1937 was in considerable measure due to this factor.

The factory employment index of the U.S. stood in the census month (Nov. 1937) at 104·1 (1923–25 base). A year later it was 93·3 and from Jan. to Aug. 1939 ranged between 92·2 and 96·4. The low point for the '30s was in 1932, 66·3. The index rose rapidly after July 1940.

Pay rolls always fluctuate more violently than employment because of overtime and part-time work. The monthly average of pay rolls (1923–25=100) was 110·4 in 1929; but 46·7 in 1932; 85·6 in 1936; 102·0 in 1937; 77·5 in 1938; 90·8 in 1939 and 100·8 the first ten months of 1940.

There were employed on public work financed by other than "regular" appropriations in the United States, approximately 3,423,000 people in June 1938. This was the highest monthly figure for work relief down to the end of 1940. There were 2,671,462 in Sept. 1939. The Sept. 1940 figure was 2,619,000. Late in 1940 declines began.

While employment exchange statistics are available for the U.S., the figures have been so profoundly influenced by relief, public works and other governmental policies that they cannot be used in comparisons with other nations.

Japan was one of the nations with high employment in 1937, a by-product, of course, of war. Their employment index (1929=100) was 128·8 in 1937, and 141·8 in 1938. In 1939 it rose to 158·0 in June. The government's official estimates of unemployment in 1932 estimated that but 6·8% of their employable population was idle, a figure hard to reconcile with an employment index of 82 that year. For Jan. 1939, their unemployment estimate was 212,254. The estimates were about 60,000 lower during 1939 than for the corresponding months of 1937. Japanese unemployment was low, 1937–39. No figures were available for 1940.

New Zealand's are entirely employment exchange figures. They indicate a gradual improvement in employment after 1934, with 1937–38 distinctly better than any year since 1933. The numbers registered ranged between 1,000 and 9,000, Jan. to Dec.

1939. These are extremely low figures, corresponding to those of 1928–30.

The only unemployment figures for Australia are compiled from reports sent in by union secretaries—a not very satisfactory type of unemployment statistics. The Australian trade union returns showed 31,000 or 7% of the union workers unemployed (monthly average) in 1927; a figure which grew steadily to 120,454 (29%) in 1932 and then gradually subsided to 53,992 (12.2%) in 1936. The figures averaged 41,823 in 1937; 40,526 in 1938; and 47,033 in 1939. The figure for Feb. 1940 was 38,830.

The employment exchange registrations in Chile jumped from an average of 29,345 in 1931 to 107,295 in 1932, and then gradually dropped to 30,055 in 1934. Since then, applications for work have been at low levels. Registrations averaged only 10,672 per month in 1935; 6,474 in 1936; 3,215 in 1937; 4,578 in 1938; and from 7,600 to 11,200 in 1939 and to April 1940. (*See* also SOCIAL SECURITY; UNITED STATES; WAGES AND HOURS.) (D. D. L.)

Unemployment Insurance: *see* RELIEF; SOCIAL SECURITY.
Unemployment Relief: *see* RELIEF.

Unfederated Malay States,

area 24,728 sq.mi., population (1931) 1,600,895, is one of the three principal subdivisions of British Malaya (*see* articles, STRAITS SETTLEMENTS and FEDERATED MALAY STATES). They consist of five land states: Johore, Kedah, Perlis, Kelantan and Trengganu, and of Brunei, which is on the island of Borneo. The states are ruled by native sultans who have treaty relations with the British crown under which British advisers are appointed for the general supervision of administration. The area and population of the various land states are (1938) as follows: Johore 7,330 sq.mi., population 709,870; Trengganu 5,050 sq.mi., pop. 201,370; Kedah 3,660 sq.mi., pop. 481,242; Kelantan 5,750 sq.mi., pop. 399,299; Perlis 310 sq.mi., pop. 55,446. There are Japanese iron concessions in Johore, which is opposite Singapore, and in Trengganu. Rubber is the chief product of the states; they also produce a surplus of rice and copra.

(W. H. CH.)

"Union Now": *see* PACIFISM.
Union of South Africa: *see* SOUTH AFRICA, THE UNION OF.

Union of Soviet Socialist Republics.

Area, Aug. 1940: *c.* 8,350,000 sq.mi. (Aug. 1939: 8,175,500 sq.mi.), over one-fifth of which lies within the Polar circle; population, including that of the new territories incorporated in the U.S.S.R. since Sept. 1939, but exclusive of the natural growth of the population of the soviet union in 1939 and 1940, was given by M. Molotov on Aug. 1, 1940 as 193,000,000. The general increase in the population of the U.S.S.R. for the period of 12 years to Jan. 1939 amounted to 23,439,271, or 15.9%, the rate of increase varying throughout the period (*see* below: *1939 Census*). Sixty-four per cent of the population of the soviet union lives in the Russian Soviet Federated Socialist Republic (78% of the U.S.S.R. territory), and the remaining 36% of the population is distributed almost in equal halves between the Ukrainian S.S.R. (2% of the territory) and the nine other union republics (total territory, 20%). In Jan. 1939, Great Russians constituted 58.4% of the population (as against 53% at the end of 1926); Ukrainians, 16.6% (21.2%); White Russians, 3.1% (3.2%); Uzbeks, 2.9% (2.7%); Kazaks, 1.8% (2.7%); Tatars, 2.5% (2%); Jews, 1.8% (1.8%); Azerbaidzhanis, 1.3% (1.2%); Georgians, 1.3% (1.2%); Armenians, 1.3% (1.1%). Altogether some 60 different ethnic groups are comprised in the union. The 140-odd languages and dialects spoken in the U.S.S.R. belong to the following groups: Indo-European, Caucasian, Semitic, Ural-Altaic (Finno-Ugrian, Samoyede, Turkic, Mongolic, Tungusic), Palaeo-Asiatic and Far Eastern. Eleven cities have a population of over 500,000: Moscow, 4,137,018; Leningrad, 3,191,304; Kiev, 846,293; Kharkov, 833,432; Baku, 809,347; Gor'ki, 644,116; Odessa, 604,223; Tashkent, 585,005; Tiflis, 519,175; Rostov-on-Don, 510,253; Dnepropetrovsk, 500,253.

History.—With the beginning of 1940 the Russo-Finnish war entered on its second, inconclusive, month. The Finns were exploiting every strategic resource of their territory. The red army was checked alike in the sparsely populated north and on the strongly fortified Karelian isthmus: everywhere save in the Petsamo region. The difficulties of a winter campaign, and, in particular, the valour, equipment and fortifications of the Finns, had evidently been underrated by the soviet authorities. Not till February did they establish a superiority in numbers and artillery, as well as in aviation, which enabled them to effect a break-through on the isthmus, leading to the peace treaty (signed March 12, 1940) which transferred to Russia *c.* 16,175 sq.mi. of Finnish land and lakes with less than half of the original population estimated at 450,000. The new frontier runs from west of Viipuri (90 mi. from Leningrad as against the 20 mi. distance fixed in 1920) along a line roughly coinciding with that laid down at the Peace of Nystad between Peter the Great and Sweden (1721). In the north the region of Kuolajärvi and the Fisherman's and Middle peninsulas were ceded to the U.S.S.R., together with transit rights to Norway and to Sweden. Moreover, the U.S.S.R. obtained a 30 years' lease of the Hangö peninsula. These peace terms considerably restricted Finland's ability to resist Russia in case of future misunderstandings or further demands; but though much heavier than the original terms, they were yet lighter than those canvassed by the U.S.S.R. at the outset of the war. These gains cost Russia in casualties 49,000 killed and 159,000 wounded, according to the Russian general staff; General Mannerheim estimated 200,000 Russians killed or frozen to death.

The violation by the U.S.S.R. of the Soviet-Finnish non-aggression pact evoked vehement protests throughout western Europe and the U.S.A.; even from circles where sympathy with the soviet regime extended to justifying soviet policy between August and Oct. 1939. It exposed the union to a near-rupture of diplomatic relations with, and to the threat of armed intervention by England and France, after the League of Nations had excluded the U.S.S.R. from membership and called for help for the victim of aggression (Dec. 14, 1939). These protests and threats the soviet government met with the defence that its policy was serving, not imperialist ambitions, but the security of the union; and with violent attacks on the "capitalist democracies." The soviet-German trade agreement of Feb. 11, 1940, with its considerable economic concessions to Germany, may be partly explained as a reaction to the same factors.

The German occupation of Denmark and Norway and the further success of German arms in the Low Countries and France conduced not only to revise western views of the positive part the soviet union might play in this war, but also to quicken soviet realization of the pitfalls in a continuation of friendly neutrality towards Germany. Within a brief few weeks the seemingly impossible became reality: Sir Stafford Cripps was appointed envoy extraordinary to the Kremlin, while soviet press, radio and official pronouncements were gently but firmly defining soviet foreign policy as one of strict neutrality, and "arming to the teeth" as the basic aim of all soviet domestic planning and activities. Decree followed decree, aiming to perfect the country's preparedness and efficiency—both military and economic—in case of war. The red army sacrificed its most cherished privileges of

communistic self-government: a decree of May 7 abolished the army Komsomol discussion clubs and the right of debating the character and conduct of superiors, restricted the powers of the political commissars, while increasing those of the professional officers, and established strict rules of deference to superiors.

Developments in the west probably contributed also to intensify soviet pressure on the Baltic states. Alleging that the non-aggression pacts binding these states to the U.S.S.R. were being stultified by intrigues of the leading groups in the three states, the Kremlin demanded in the middle of June a change in the composition of the Baltic governments and the right to reinforce its garrisons in the Baltic countries. A month later, following elections on a fresh electoral basis, the parliaments of these states unanimously adopted a soviet constitution and requested to be incorporated in the soviet union.

On June 26 Molotov addressed to Rumania a demand for the settlement of soviet-Rumanian disagreements. Rumania was to agree within 24 hours to the retrocession of Bessarabia and the cession of northern Bukovina, "the great majority of whose inhabitants are bound to the soviet Ukraine by a common history, common language and common nationality." Failing to obtain a respite for discussions, the Rumanian government agreed to surrender the two provinces within four days (June 28–July 1).

Between Aug. 1 and 6 the Baltic republics, as well as the Karelian and Moldavian, were by the supreme soviet unanimously admitted to the Union of Soviet Socialist Republics, the number of which was thus increased from 11 to 16. The territorial gains of the U.S.S.R. in the ten months from Sept. 1939 to July 1940 amount to *c.* 174,500 sq.mi. (roughly double the area of Britain), with a total population, according to soviet data, above 23,000,000; of whom "nineteen-twentieths previously formed part of the population of the U.S.S.R." The totals are composed as follows: western White Russia and western Ukraine—*c.* 75,000 sq.mi., with over 13,000,000 inhabitants; ceded Finnish territory, *c.* 16,175 sq.mi., with perhaps 200,000 inhabitants; the Baltic states, 63,847 sq.mi., with 6,000,000 inhabitants; Bessarabia, 17,177 sq.mi., with 3,200,000 inhabitants; northern Bukovina, 2,316 sq.mi., with a population of over 500,000. The economic importance of these accretions is of course overshadowed by their strategic significance.

In the course of 1940 the U.S.S.R. signed new trade agreements with Iran, Afghanistan, Sweden, Hungary, Finland, Bulgaria, Yugoslavia (which had only just accorded diplomatic recognition) and Germany. The contents of the soviet-German pact have not been disclosed. References in the press of the two countries have revealed no more than that "the trade turnover between the contracting parties is intended to surpass the record turnover of the year 1931," when it amounted to r.m. 1,066,000,000 according to German, and to Rbls. 2,365,000,000 according to soviet statistics.

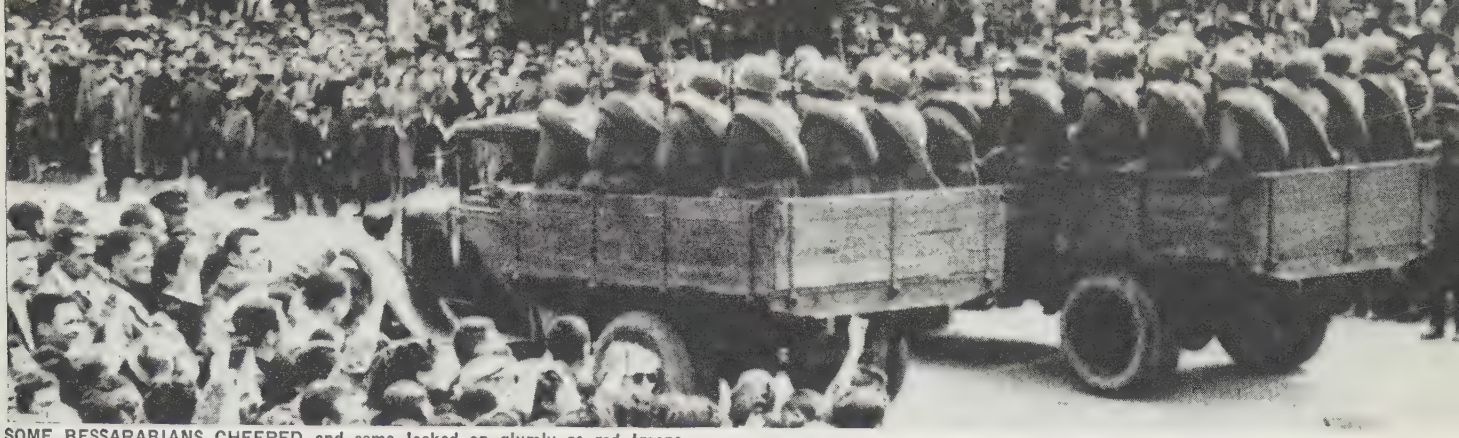
The possibility of improving Anglo-Russian relations and concluding a trade pact was examined in conversations begun in the second half of March 1940 between representatives of Britain and Russia. On April 19 and May 8 the British government inquired whether the soviet government was prepared: (1) to disclose the provisions of the soviet-German trade agreement, and (2) to guarantee that goods imported into the soviet union would not be re-exported to Germany. The soviet government (on April 29 and May 20) negatived the former query, insisting on the right of neutral states to trade freely according to their own economic requirements; but, regarding the second, agreed to guarantee in general terms that imports from Britain would not be re-exported. The conversations, however, made little progress, being further complicated by questions touching the cancellation of soviet orders in Britain; the release of ships detained by Britain; and the closing of the Burma road without prior notice to the U.S.S.R.; but, above all, from July on, by the question of British recognition of soviet absorption of the Baltic states with all the consequences thence issuing. On Oct. 22 Sir Stafford Cripps informed the soviet government that the British government—in return for neutrality and for an undertaking to conduct no anti-British propaganda—were prepared to give *de facto* recognition to the inclusion of the Baltic states within soviet frontiers, *de jure* recognition to be determined at the next peace conference, in which the soviet union is to participate as an equal partner; they were also prepared to offer an assurance that Great Britain would not join a bloc hostile to the soviet union. U.S.-Russian, like Anglo-Russian, conversations made but little progress: no agreement was reached relative to the removal of the embargo, imposed during the Finnish war, on aviation equipment and machine tools, or to the release by the U.S.A. of shipping and funds belonging to the Baltic states. Nevertheless, on the expiry of the soviet-U.S. trade agreement (on Aug. 7), it was mutually prolonged for a further year. At the end of November further conversations, characterized by Sumner Welles as "friendly and concretely constructive," were in progress. Soviet relations with Japan assumed—despite continued soviet help to China, which, however, became both less patent and less extensive in scale—a more normal complexion, and on June 9 an agreement was reached concerning the exact demarcation of the frontier in the Khalikhingol river area.

The Berlin-Rome-Tokyo pact of Sept. 27 might in certain circumstances be turned against the U.S.S.R. At the same time the current extension of German-Italian influence in the Balkans raised in a new form a problem of orientation for the foreign policies alike of the soviet union and of Britain and the U.S.A. The attitude of the union to the Balkan question, and in particular to Turkey, remained to be clarified, as did the extent of soviet-German agreement and its duration. In attempting to evaluate the policy of the union, it is essential to bear in mind that the tragic balance sheet of the War of 1914–18 is ever present in Russian memory, for that war and the ensuing "settlements" cost Russia 5,500,000 dead and wounded, and 333,000 sq.mi. of territory, with 30,000,000 inhabitants, of whom a substantial proportion were Russians.

Economic Planning.—*Third Five-Year Plan, 1937–42.*—Full details of the plan are still lacking and information on estimates and results for 1939 and 1940 is incomplete. To capital construction 192 milliard roubles are to be devoted, of which 112 milliards are allotted to industry, primarily heavy industry (94 milliards to be invested in capital goods production and 18 milliards in production of consumers' goods). The scope of industrial construction projected may be judged by the following percentage increases postulated for the end of the five-year period in 1942; total industrial output, 136% (the corresponding figure was 92% for the first, 114% for the second five-year plan); oil, 77% (85% and 111%); steel, 58% (162% and 189%); coal, 90% (112% and 137%); chemical industry, 137%; machine-building, 129%; and electric power, 106%. The productivity of labour is to increase by 65%; the manufacturing costs are to be lowered by 10%; and improvement in the quality of goods is to be attained in all branches of industry.

In agriculture the increases aimed at are: for gross agricultural yield, 52%; grain, 27%; cotton, 28%; sugar-beets, 29%; for livestock, the rates vary from 35% (horses) to 110% (sheep and goats). The number of tractor plows is to reach a total of 550,000; sowing is to be mechanized up to 80% and harvesting of grain up to 75%.

The railway freight traffic is expected to rise by 44%; 11,000 km. of new line are to be built (the chief item of construction is the Stalin-Magnitogorsk main line), 8,000 km. to be double-



SOME BESSARABIANS CHEERED and some looked on glumly as red troops entered the city of Kishinev July 3, 1940, to occupy territory ceded by Rumania to the U.S.S.R. a week before

tracked, 1,840 km. to be electrified. The river and canal traffic is to increase by 76%. One of the most important enterprises envisaged by the plan is the regulation of the depth of the Volga along its whole course by means of a number of dams which are to be constructed on the Volga and Kama. In the Kuibyshev electric power centre a very large reservoir (600 km. by 20 km.) is to be built to irrigate 3,000,000 ha. of land in the Volga region, which is a major granary of the union. The energy of the hydraulic power stations at Kuibyshev, scheduled to generate 3,400,000 kw. by 1952 when all of them are completed, is to be used for the development of industry east of the Volga and also to supply current to other regions, including the Urals. A whole series of new canals is projected, the most considerable of which is a 100 km. link between the rivers Volga and Don at the level of Stalinograd. The aim of the new construction schemes is "to bring industry closer both to its raw materials and to the consumption areas, so as both to rationalize transport problems and to develop the economically backward regions."

Results for 1939. On the basis of data so far published by the State Planning commission (in terms of value, not volume), the economic results in industrial production for the year 1939 can be summarized as follows: total industrial output increased by 14·7% and the productivity of labour by 17%, which percentages are above the yearly averages laid down for the third five-year plan. The greatest increases of production were registered in the defence industries group, comprising the aeroplane, munitions, armaments and the shipbuilding industries, which showed a rise of 46·5%; heavy and medium machine-building industries, 13·7% and 15·1%, respectively; non-ferrous metallurgy, 14·1%; chemical industry, 12·6%; coal industry, 9·2%. Light industry recorded an 8·1% increase; the meat and dairy industry, 14·2%.

In agriculture, too, the year 1939 showed satisfactory results. The grain harvest amounted to 11% more than in 1938 (7·7% above the yearly average for the period 1935–1939); important increases over 1938 were also claimed in the yield of potatoes (60%), sugar-beets (26%), flax (16%), cotton (5%). The second half of the year was, however, marked by a deterioration in the work of the machine-tractor stations, with the result that neither the annual plan for plowing nor the plan for the reduction of the costs of operation was fulfilled; by July 1, 25% of the wheel tractors required major repairs.

Results for 1940. The year 1940—the third in the current five-year plan—is of decisive importance for the realization of the plan as a whole. Information so far available shows that the progress achieved in 1939 continued in 1940, special emphasis being laid, as in the previous year, on the development of heavy industry, and of the defence industries in particular. The expenditure on defence in the state budget was more than double the figure of 1938. Ferrous metallurgy, especially the extraction of ores and fuels—notably oil—continued to lag behind other branches of production, though they were to have led the rest. Transport as formerly met the growing requirements of the national economy only with the greatest difficulty. The production of consumers' goods, the deficiency of which has been long and acutely felt by the population, yielded precedence to the urgent need of capital goods. In the first four months of 1940 light industry lagged behind schedule.

At the beginning of the year higher quotas of production were introduced and the soviet government called for the realization of five-year objectives in labour productivity in four years. On April 6 a new soviet income-tax statute was promulgated, imposing progressive taxation on incomes in excess of 150 roubles per month (average wage, *c.* 275 roubles per month). The tax, payable monthly, covers basic wages, payments for overtime and piecework, personal bonuses, premiums, etc. Additional sacrifices "to strengthen still further the national defence of the country" were demanded of the working population in an important decree of June 26, issued by the praesidium of the supreme council. This decree introduced an eight-hour working day, instead of the seven-hour day, in factories, co-operatives and public enterprises for workers and employees over the age of 16, as well as adding a working day to the week, both changes to take place without extra pay (in case of piecework the quotas were to be reduced proportionally to the increase in working hours); unauthorized quitting of enterprises or institutions by workers and employees was prohibited by the decree; those who disobey were to be tried and imprisoned, while shirkers were to be punished with correctional labour for a period up to six months at the place of their employment and deprived of 25% of their wages. On July 10 a decree provided punishment (imprisonment for five to eight years) for negligence in achieving prescribed standards in the production of goods, "a crime against the state equivalent to wrecking." On Oct. 2 a decree of the supreme council ordered the calling up of all youths between the ages of 14 and 17 for work in state factories, mines, transport, etc. They were to be mobilized for four years and the first 600,000 were called up between Nov. 10 and 25, to form a "state labour reserve" to be at the disposal of the Council of People's Commissars.

As in industry, so in agriculture, government ordinances for the year 1940 aimed at achieving maximum production within a minimum of time, while tightening discipline and reducing production costs. The new decrees base the requisite delivery quotas of grain and of a number of other agricultural products on total acreage of farmland and not, as before, on acreage under cultivation, as well as fixing new methods of crop planning on the collective farms. The chief aim of the agricultural plan for 1940 was to raise crop yields. Collective farms had to average 11·2 qu. per hectare of grain, 13·3 qu. of cotton, 3·7 qu. of flax fibre, 200 qu. of sugar-beets and 112 qu. of potatoes. The area under grain was to remain practically the same as in 1939. The area under industrial crops was to increase to 10,613,000 ha., 116,000 ha. more than in 1939. The area under feed crops was to be 14,618,000 ha., a 4,412,000 ha. increase over 1939. A large increase in livestock is estimated for 1940. The use of fertilizers

was to be extended, special care was to be given to storing, cleaning and testing of seed, and essential attention was to be given to the timely repair of tractors.

To sum up, one may affirm that, despite a series of important shortcomings both in planning and in production, especially on the qualitative side of production—references to which abound in soviet periodicals—the fundamental aims of the plan, above all its military aims, were in 1940 being rapidly and intensively pursued. With the completion of the third year of the plan undisturbed by any major shock of war, it should be considered that the third plan had on the whole struck solid roots in reality, and that along a considerable number of lines of the national economy the significance of what has been achieved undoubtedly exceeded three-fifths of the five-year program. Government measures in 1940 would result in a further increase of production (the decree of June 26 alone should achieve an increase of one-sixth and is equivalent to the recruitment of 2,000,000 more workers), but it may be doubted whether they would succeed in balancing the execution of the plan as a whole, or help to eliminate the anomalies of development, inherited from the previous ten years, which the third five-year plan was designed in great part to correct.

1939 Census.—The latest census, the findings of which have not yet been completely systematized, showed an increase in population from 147,027,915 on Dec. 17, 1926 to 170,467,186 on Jan. 17, 1939; *i.e.*, an increase of 15·9% during this period of 12 years, one month. This growth is a very considerable one, if compared, *e.g.*, with that of the population of the rest of Europe, which soviet statisticians assess at not more than 8·7% for the same period. The yearly average for the period (1·36%) does not accurately indicate the rate of growth of the soviet population, inasmuch as this rate was by no means constant during these years. If in the first six years the population increased, as indicated by soviet figures issued in 1932–33, by 18,700,000, the increase in the following six years can have amounted to no more than 4,700,000. This fall in the rate of increase derives primarily from the years 1933 and 1934, appearing as a result on the one hand of the twin burdens of the five-year plan and collectivization, and on the other hand of the famine prevailing in those years. The second five-year plan (1932–37) was based on the assumption that the population of the union would have grown by the end of 1937 to 180,700,000; the rural population was to have reached 134,600,000 at such time, whereas the 1939 census figures assign to it only 114,500,000.

The vast increase of the urban population throughout the union is clearly apparent in the Table II on page 681, which shows a more than twofold increase during these 12 years, until in 1940 the urban population amounted to little less than one-third of the total population (1897, 11·5%; 1926, 17·9%; 1939, 32·9%).

The population of Moscow doubled itself in 12 years; and that of the other ten cities numbering over 500,000 inhabitants increased one and one-half to three times. Thirty-four towns of the union showed in the same period a population increase varying from three to ten times; the population of Prokopevsk, Dzerzhinzk, Murmansk, Stalinobad and Stalinsk increased by more than ten times; Komsomolsk, Stalinogorsk, Magnitogorsk and Karaganda, totalling 459,000 inhabitants, are new towns, built in the period between 1926 and 1939.

The population of the U.S.S.R. is unevenly distributed between its constituent regions. Whereas the average density is eight inhabitants per sq.km., both the northern zones of the tundra and targa and the southern deserts of Kazakistan and the central Asiatic republics average less than one person to the sq.km. Over the rest of the soviet territory the average density of population slightly exceeds that of the U.S.A. The 1939 census showed that 94% of the total population was concentrated within one-third of the area—while nearly half the population occupied only one-seventeenth of the area. The census showed a displacement of population (1) to the Urals, Siberia and the far east, which received in these 12 years more than 3,000,000 migrants and increased in population by 33%, and (2) to the Uzbek, Tadzhik, Turkmen and Kirghiz S.R., which absorbed 1,700,000 migrants and increased in population by 38%. Eastward, to Asiatic Russia, is also moving the large-scale industry, which is rapidly being built up in the Asiatic parts, with capital accumulated in, and skilled labour forthcoming from, the European parts of the union.

According to age groups the population was distributed as fol-

Table I.—*Industry, Agriculture and Transport in the U.S.S.R.*

	Unit of Measure	1st Five-Year Plan		2nd Five-Year Plan		3rd Five-Year Plan	
		1928 Performance	1932 Performance	1933 Performance	1937 Performance	1938 Perform.	1942 Plan
INDUSTRY							
Coal	Million tons	35.5	64.7	76.2	127.9	132.9	243.0
Pig Iron	,, ,,	3.3	6.2	7.1	14.5	14.5	22.0
Steel	,, ,,	4.3	5.9	6.9	17.7	18.0	27.5
Petroleum and Gas	,, ,,	11.7	22.3	22.5	30.5	32.2	54.0
Electric Power	Milliard Kw.	5.0	13.5	16.4	36.4	39.6	75.0
Automobiles	Thousands	0.7	23.9	47.9	200.0	211.4	400.0
Cement	Million tons	1.8	3.5	2.7	5.5	5.7	11.0
Paper	Thousand tons	0.3	0.5	0.5	0.8	0.8	1.5
Cotton Textiles	Milliard metres	2.7	2.4	2.4	3.4	3.5	4.9
Leather Footwear	Million pairs	29.6	84.7	80.3	164.2	213.0	258.0
Sugar, Granulated	Million tons	1.3	0.8	1.0	2.4	2.5	3.5
AGRICULTURE							
Total Sown Area	Million hectares	113.0	134.4	129.7	135.3	136.9	..
Area under grain	,, ,,	92.2	99.7	101.5	104.4	102.4	..
Crop yield:							
Grain	Million met. quin.	733.2	698.7	898.0*	1,202.9*	949.9*	1,300.0*
Cotton, raw	,, ,, ,,	8.2	12.7	13.2	25.8	26.9	32.9
Flax, fibre	,, ,, ,,	3.2	5.0	5.5	5.7	5.5	8.5
Sugar-beet	,, ,, ,,	101.4	65.6	89.9	218.6	166.8	282.0
Livestock:							
Horses	Million head	33.5	19.6	16.6	16.7	17.5	21.9
Horned cattle	,, ,,	70.5	40.7	38.4	57.0	63.2	79.8
Sheep and goats	,, ,,	146.7	52.1	50.2	81.3	102.5	170.7
Pigs	,, ,,	26.0	11.6	12.1	22.8	30.6	45.6
Tractors (total)	Thousands	34.9	148.5	210.9	454.5	483.5	..
Tractors H.P. (total)	Millions	0.4	2.2	3.2	8.4	9.3	9.8
TRANSPORT							
Railroad:							
Length	Thousand km.	76.9	81.6	82.1	84.9	85.0	96.0
Freight carried	Million met. tons	156.2	267.9	268.1	516.7	516.3	744.0
Freight carried	Milliard ton/km.	93.4	169.3	169.5	354.8	370.5	510.0
Passengers carried	Millions	291.1	967.1	927.0	1,142.0	1,177.8	1,463.0
River:							
Length	Thousand km.	71.6	77.6	82.2	86.9	90.6	..
Freight carried	Million met. tons	18.3	46.9	44.7	66.9	66.6	..
Freight carried	Milliard ton/km.	15.9	25.1	25.8	33.1	32.0	58.0
Passengers carried	Millions	17.8	43.6	41.6	61.0	68.1	..
Sea:							
Freight carried	Million met. tons	7.9	15.1	16.3	29.4	30.4	44.5
Freight carried	Milliard ton/km.	..	20.4	24.4	37.0	33.7	51.0
Passengers carried	Millions	1.3	5.1	3.3	..	3.1	..
Air:							1940 (Plan)
Length	Thousand km.	8.8	31.6	34.8	114.5	109.0	..
Freight carried	Thousand met. tons	0.08	0.4	1.5	36.4	45.5	42.3
Freight carried	Million ton/km.	..	1.6	3.0	25.0	30.3	36.0
Passengers carried	Thousands	7.0	27.2	41.6	203.2	292.7	285.0

*Not strictly comparable with the figures for the previous years, owing to a change in the method of computation. A deduction of about 10% has been suggested by the Birmingham Bureau of Russian Research.

Table II.—*Population of the U.S.S.R. According to the Censuses of Dec. 17, 1926 and Jan. 17, 1939*

Soviet Socialist Republics	Rural Population			Urban Population			Total Population			Area†	Density of Population per sq.mi.	
	1926	1939	% of Increase or Decrease (—)	1926	1939	% of Increase	1926	1939	% of Increase	1939 (up to Sept.) Thousand sq.mi.	1926	1939
R.S.F.S.R.	76,672,807	72,620,606	— 5.3	16,785,189	36,658,008	118.4	93,457,996	109,278,614	16.9	6,374.7	14.6	17.1
Ukrainian	23,669,381	19,764,601	—16.5	5,373,553	11,195,620	108.3	29,042,934	30,960,221	6.6	171.9	168.9	180.0
White Russian	4,135,410	4,195,454	1.5	847,830	1,372,522	61.9	4,983,240	5,567,976	11.7	48.9	101.8	113.7
Azerbaijan	1,664,187	2,049,004	23.1	649,557	1,160,723	78.7	2,313,744	3,209,727	38.7	33.2	69.7	96.7
Georgian	2,083,012	2,475,729	18.9	594,221	1,066,560	79.5	2,677,233	3,542,289	32.3	26.9	99.6	131.8
Armenian	714,192	915,183	28.1	167,098	366,416	119.3	881,290	1,281,599	45.4	11.5	76.1	110.6
Turkmen	861,172	837,609	— 2.7	136,982	416,376	204.0	998,154	1,253,985	25.6	171.3	5.8	7.3
Uzbek	3,553,158	4,837,382	36.1	1,012,274	1,445,064	42.8	4,565,432	6,282,446	37.6	146.1	31.2	43.0
Tajik	926,213	1,233,209	33.1	106,003	251,882	137.6	1,032,216	1,485,091	43.9	55.5	18.6	26.7
Kazakh	5,554,905	4,439,787	—21.1	519,074	1,706,150	228.7	6,073,979	6,145,937	1.2	1,059.6	5.7	5.8
Kirghiz	879,364	1,188,714	35.2	122,333	270,587	121.2	1,001,697	1,459,301	45.7	75.9	13.2	19.2
Total for the U.S.S.R.*	120,713,801	114,557,278	— 5.1	26,314,114	55,909,908	112.5	147,027,915	170,467,186	15.9	8,175.5	17.98	20.85

*Exclusive of population incorporated in the U.S.S.R. since Sept. 1939.
†According to an official soviet computation (1939), which differs from previous figures.

lows: up to 19 years, 45·1%; from 20 to 39 years, 32·9%; and over 40, 22·0%. The percentage of literacy, 24·0% in 1897; 51·1% in 1926; 81·2% in 1939.

The social composition according to the 1939 census returns was: workers and employees, 49·7%; peasants on collective farms and handicraftsmen in producers' co-operatives, 46·9%; independent peasants and handicraftsmen, 2·6%; non-workers, 0·04%; groups not shown, 0·7%.

Education.—School pop.: elementary and secondary schools (1939), 34,260,000; higher educational institutions for adults and technical schools, 2,053,000; students in the universities, *c.* 600,000; libraries (1940), 75,000, with 160,000,000 books; newspapers, 9,000 (in 70 languages), with a circulation of 38,000,000; printed books, 700,000,000 copies. Theatres, 790; cinemas, 30,461 in towns and 18,991 in villages.

State Finances, Banking and Trade.—Estimates for 1940: Capital investments in industry, agriculture and transport from the all-union budget and other sources, 36·1 milliard roubles (15% increase over 1939). State revenue, 182,600,000,000 roubles (17·1% increase over 1939); state expenditure, 179,700,000,000 roubles (including defence services, 57,066,200,000; national economy, 57,117,500,000; cultural services, 42,875,400,000, of which education, 23,195,000,000). Banks: 37,120 branch banks and agencies; deposits in savings banks, *c.* 7,000,000,000 roubles. Subscription to third five-year plan loan, 9,310,800,000 roubles. Gross retail trade turnover in 1939, 163,456,000,000 roubles. Foreign trade figures are not available for 1939 and 1940. For statistics of production *see* ALUMINIUM; BAUXITE; CHROMITE; COAL INDUSTRY; COPPER; COTTON; GOLD; HOGS; IRON AND STEEL; LEAD; LIVESTOCK; MAGNESITE; MAGNESIUM; MANGANESE; MINERAL AND METAL PRICES AND PRODUCTION; PETROLEUM; PHOSPHATES; POTASH; PYRITE OR PYRITES; SILVER; SUGAR; SUPERPHOSPHATES; ZINC.

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(S. Ko.)

Unitarian Church. The outstanding event of the year in Unitarian churches of the U.S. was the work of the Unitarian Service committee. It grew out of the experience of the Commission for Service in Czechoslovakia, 1938–39. In Jan. 1940, the Unitarian association sent its director of foreign relations, Dr. Robert C. Dexter, and his wife, Dr. Elisabeth A. Dexter, to Europe to discover opportunities for service. As a result of their visit, the association organized the Unitarian Service committee under the chairmanship of Dr. William Emerson of Boston, for the purpose of providing assistance at home and abroad to those in need. It was planned to undertake the first venture with Czechoslovakian citizens in France, and Rev. and Mrs. Waitstill H. Sharp, who had worked in Czechoslovakia, again volunteered.

Because of the collapse of France they were obliged to make their headquarters in Lisbon, dealing with the 10,000 refugees there, where, except for the Joint Distribution committee, they were the only American representatives. Later they were able to get into unoccupied France and were active in the alleviation of the conditions of refugees. They were able to bring to the U.S. and to send to other countries, particularly Great Britain, hundreds of Czechs, French, Belgians and Germans who were suffering because of religious or political convictions or racial connection, many among the most prominent literary and political figures of Europe. Mr. Sharp returned to the U.S. in the fall, and was succeeded by Dr. Charles R. Joy. In November Mrs. Sharp brought to the U.S. the first group of children out of France. The committee has had the co-operation of the United States committee for the care of European children.

The second occupant of the new office of moderator of the denomination is the distinguished educator and president of Mills college, California, Dr. Aurelia Henry Reinhardt, who was elected in May. (J. H. L.)

United Kingdom: *see* GREAT BRITAIN AND NORTHERN IRELAND UNITED KINGDOM OF.

United States. The population of the United States in 1940, as determined by the decennial federal census, was 131,669,275, not including possessions. This figure represents an increase of 8,894,229 over the census of 1930. With possessions included, the population was 150,621,231. The area of continental U.S.A. is 3,026,789 sq.mi. For population figures of the individual states, *see* the articles on the separate states. *See* also the articles BIRTH STATISTICS; CHURCH MEMBERSHIP; DEATH STATISTICS; EDUCATION; ILLITERACY; INDIANS, AMERICAN; NEGROES (AMERICAN); UNIVERSITIES AND COLLEGES, etc., for statistical information of social conditions. (X.)

History.—The year 1940 was the most critical year in U.S. history since President Roosevelt's accession to power in 1933. It was faced by two major problems, not unrelated to each other. First, the people of the country were called upon, in the presidential year, to decide whether they should continue the party of the New Deal in office and should break the tradition of a century and a half by electing Mr. Roosevelt for a third term, or should entrust the government to the Republicans, who, while supporting many of the policies of the past seven years, yet criticized sharply the methods by which these policies had been carried out and condemned the administration on the score of its augmentation of the national debt, its alleged use of federal re-

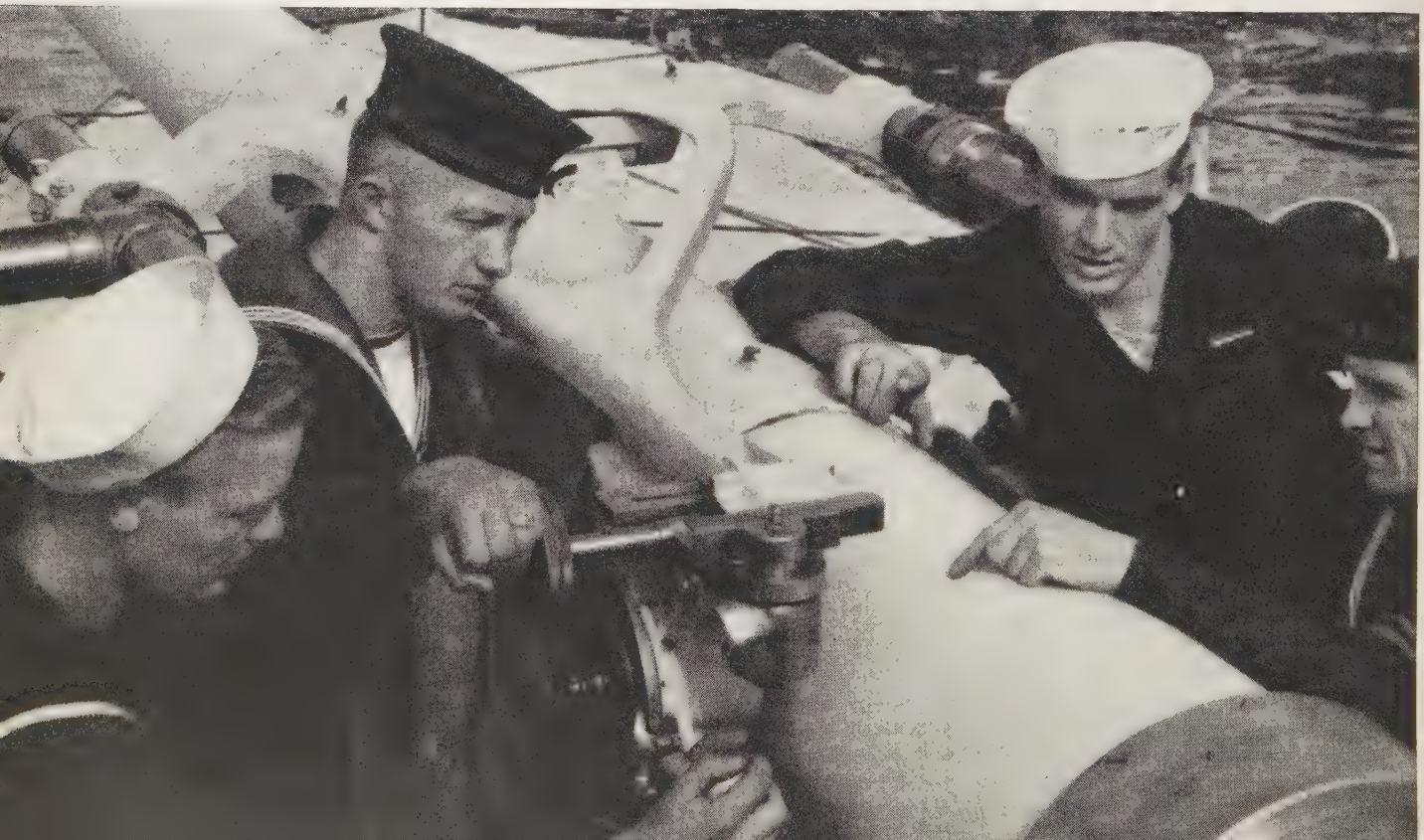
lief funds to secure political support, its obstruction of industrial recovery by measures of undue severity against private business and its encouragement of class spirit. Playing a major part in this party rivalry and creating an unprecedented anxiety and confusion among the American people, was the foreign situation, which grew more critical with each passing month. Herr Hitler's assurances at Munich, in Sept. 1938, that his aims would be fulfilled with the incorporation into the fatherland of the Germans lying outside the third reich, had already been broken by his destruction of Czechoslovakia, his seizure of Danzig and his invasion and annihilation of Poland. His purpose to force the nazi regime on Europe, and perhaps the whole world, stood clearly revealed and boastfully confessed. The year 1940 demonstrated the overwhelming superiority of Hitler in planes, tanks and submarines. The year closed with the fate of Britain hanging in the balance and the people of the United States divided between the determination to keep the United States out of the war and the apprehension lest the nazis, victorious over Britain, should proceed to the assault on the democracies of the western hemisphere. (See *Foreign Relations*.)

In the early months of 1940 there was a slight recession in business, but in the spring the foreign demands for U.S. iron, steel, cotton, aircraft and industrial machinery initiated a war boom which brought the business index higher than that of 1929, and provided work for about 3,000,000 men. Corporation reports at the end of the year showed profits generally comparable to those of the previous year, though the payments of extra dividends in the closing weeks were less generous than in 1939, on account of the alteration in the tax laws on undistributed profits.

The 16th decennial census, compiled by the director, William L. Austin, showed a population of 131,669,275 for the continental United States, with an additional 2,595,956 for Alaska, Puerto Rico, Hawaii and other outlying territories and dependencies, exclusive of the estimated 16,356,000 inhabitants of the Philippines. Three distinct trends are noticeable in the first of these figures as compared with the census of a decade ago. First, the rate of increase in the 48 states since 1930 has been only 7·2%, as compared with 16·1% for 1920–30. The 1940 rate is the lowest in all the decades since the first census was taken in 1790 (the average increase being about 25%), and this low rate may be attributed to a combination of causes, prominent among which have been declining immigration and the serious economic depression of the 1930s. To say that the U.S. population is tending to become stationary because the land is "filling up" seems almost ridiculous when it is remembered that the density of population in the United States is only about 44 to the square mile, as against more than ten times that number in Great Britain. The second fact revealed by the census of 1940 is the slowing up of the growth of the cities, as compared with suburban developments encouraged largely by the convenience of the automobile for residence in the suburbs. The rate of increase in the 237 cities of more than 25,000 inhabitants was only 5·2%, compared with 23% in the previous decade. The five leading cities (New York, Chicago, Philadelphia, Detroit, Los Angeles) still held their respective rank, but only in New York was the gain (from 6,930,446 to 7,454,995) impressive. Chicago gained 20,370 in the decade, and Philadelphia lost population, as did Cleveland, St. Louis and Boston. Pittsburgh and San Francisco gained. In the third place, the census showed an increase of people over 45 years of age, from 22% of the total population in 1930 to 30% in 1940, with nearly 2,000,000 fewer children under the age of ten; a trend which, if continued, will have serious effects upon educational, economic and social security programs. A sinister fact has been the increasing migratory population from farms, mines and lumber camps. About 350,000 families, or 2,000,000 persons are on the move every year, and at one time 4,000 vagrants were said to be passing through Chicago every day. On the other hand, an encouraging fact is the decline of illiteracy to a point which made it seem advisable to omit the literacy test from the 1940 census. It is estimated that since 1935 agencies like the WPA and the CCC have taught 1,250,000 persons to read and write. (*See* also CENSUS, 1940.)

The wealth and resources of the United States are enormous.

AS THEY DELIVERED the first of 50 over-age U.S. destroyers to the British fleet under the deal announced Sept. 3, 1940, American sailors demonstrated the fine points of the guns to the British crews in Canada

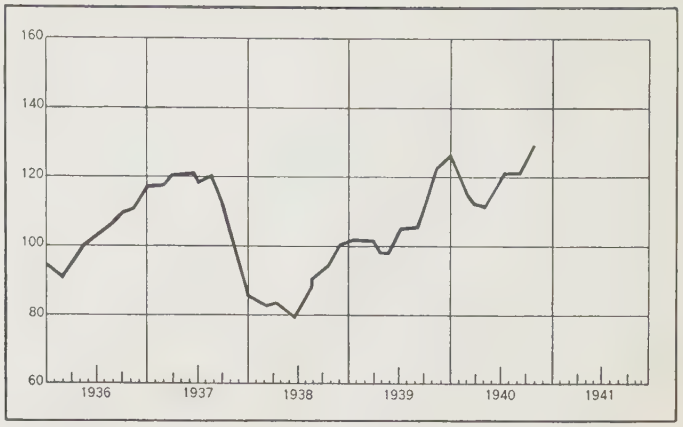


Occupying only 6·5% of the world's surface, it had in 1940 45% of the world's wealth, 70% of its gold reserves, 62% of its oil, 50% of its cotton, 33% of its steel, copper and coal. The United States built 2,000,000 more automobiles and trucks than all the rest of the world combined, and had more than half the world's telephones. The estimated national income for 1940 is $68,500,000,000, an increase of some $4,500,000,000 over that of the previous year, but still far below the figures of the pre-depression years or the $80,000,000,000 set by the president as the attainable goal.

Congress.—The second session of the 76th congress (senate 73 Dem., 23 Rep.; house 262 Dem., 169 Rep.) convened on Jan. 3, 1940, and sat through the entire year of 366 days—a record unequalled in United States history. Despite the fact that it was an election year, when congressmen and senators are usually intent on repairing their political fences, and that the president favoured an adjournment, promising to call congress back to Washington in case of an emergency, the members felt that the foreign situation was so precarious that they could not leave the capital. The president's message took note of the European war, which had been declared four months before, but which up to the beginning of 1940 had seen no aggressive movement on the part either of the nazis or of the Allies—a sitzkrieg rather than the expected blitzkrieg. The war, when it began in earnest, would doubtless affect the political and economic policies of the United States, and the United States might be expected to participate in the peace which would follow. No further domestic reforms were proposed by the president. The renewal for a third three-year period of the authorization of Secretary Hull's reciprocity pacts was recommended. As the spring and early summer brought rapid nazi victories, the question of U.S. defence preparedness occupied the attention of congress more and more. (See *National Defence* below.)

Apart from defence measures, the legislation of the year was not very impressive. A second Hatch bill was passed in July, extending the provisions of the Hatch bill of 1939 (which prohibited employees of federal agencies from participating in electioneering activities) to state and local agencies, like relief, social security, highways and schools, which derived part of their support from federal funds, and limited to $3,000,000 the amount which any party might spend in a campaign and to $5,000 the contribution of any individual or corporation to the same. The Ramspeck bill, bringing into the classified civil service large numbers of the 400,000 out of the 1,000,000 government employees not already under the civil service rules, was passed late in November, after a two years' fight. The Logan-Walter bill, providing that the rules and regulations of the quasi-judicial federal agencies, like the National Labor Relations board, should be subject to review by the courts, was passed by the house in June, and, after a bitter struggle, was approved by the senate on Nov. 26 by the close vote of 27 to 25. It was vetoed by the president on the ground that it would cause immense confusion and delay in the functioning of the boards affected, and the veto message was accompanied by a supporting opinion from Attorney-General Robert Jackson. The house failed of the two-thirds vote (153 to 127) necessary to override the veto, though 39 Democrats voted with the Republicans against the president. The most important piece of unfinished business in domestic legislation when the year closed was the amendment of the National Labor Relations act, consisting of a score of changes which the house committee had recommended in March. (See *NLRB* below.) The debt limit was raised from the $45,000,000,000 fixed by act of congress in 1916 to $49,000,000,000.

The Budget.—The president's budget message, which was sent to Congress the day after the regular message, made a gesture in



INDUSTRIAL PRODUCTION in the United States; Federal Reserve Board index, with adjustment for seasonal variation (1935–39=100)

the direction of reducing the deficit, which for 11 years had ranged between $1,384,000,000 (1938) and $4,550,000,000 (1936), totalling $27,356,000,000. The constantly recurring proposals to pare down the relief appropriations, in the hope that revived business would absorb a large number of the unemployed, were as constantly thwarted. The charges for the maintenance of the government and the servicing of the debt were obligatory. Appropriations for the army and the navy increased from year to year. The treasury took in larger receipts, to be sure, but the expenditures more than kept pace with the income. New taxes or further borrowing, or both, seemed the only expedient. President Roosevelt recommended an appropriation of $975,000,000 for relief for the fiscal year 1940–41, and hoped that the relief rolls might be cut to 1,350,000. But by autumn the rolls still showed over 1,700,000 on relief, and the president had asked that the entire $975,000,000 be spent in eight months instead of over the year. In his budget measure he had estimated the deficit for the year at $2,276,000,000; but the tremendous program of national defence entered upon as the possible effects of the European war on the United States and the other nations of the western hemisphere became evident threw into the discard all the budgetary estimates of the beginning of the year. What the cost of U.S. preparedness may be no one could predict. More than $13,000,000,000, or twice the amount of the estimated receipts of the treasury, were authorized for defence, and that figure may be doubled before the United States is allowed to return to a normal life of peace. To meet this expense only a slight provision in new taxes was made, calculated to yield perhaps $3,000,000,000 or $4,000,000,000. On July 1 taxes on amusements and luxuries of various sorts were newly levied or increased, and the income tax base was broadened by the lowering of the exemptions to include about 2,000,000 persons who had never paid an income tax before. A flat 10% addition to all federal income taxes was also enacted.

The Farm Problem.—No major agricultural legislation was passed during the year 1940. The farm income for the year was estimated at $8,900,000,000, a slight gain over the figure of 1939 and almost double that of 1932 ($4,600,000,000). The appropriations for benefit payments and farm relief exceeded the $700,000,000 recommended by the house committee early in the year. The census showed 32,000,000 people, about 25% of the population of the country, living on farms, as compared with 33% in 1910. Farm tenancy, which had reached the alarming proportion of 42%, was a major problem, especially in the south; and propositions were made in congress for loans at 3% to help farmers purchase their own homes, as well as for aid in abolishing rural slums (see *Housing*). The government held about 18,000,000 bales of cotton, taken off the farmers' hands to preserve Secretary Wallace's "ever normal granary" scheme, and in 1940

the Federal Surplus Commodities corporation supplemented the food stamps of 1939 by cotton stamps. A person could buy $4 worth of these stamps and exchange them for $8 worth of cotton goods at the stores, and the government would redeem the stamps for cash from the merchants or bankers. Thus the double purpose of reducing the cotton surplus and increasing the buying power of the poorer public would be fulfilled. With wheat at 68.2 cents a bu., corn at 59.4 cents a bu., and cotton at 9.3 cents a lb., farm prices showed an increase of 75% over the corresponding figures for 1932, though they were still far below the prices of $2.16, $1.51 and 35.4 cents respectively for 1919. Agriculture, like every other domestic interest, was bound to be affected by the European war. Grain fields were being destroyed, animals slaughtered and millions of peasants driven into an exile of starvation. The U.S. had in 1940 an overabundance of food of all kinds. The president recommended an appropriation of $50,000,000 for the refugees, and the question was being warmly debated as to whether the United States should undertake to feed the destitute people of Europe, as it did after the World War of 1914–18. The humanitarian demand was countered by the fear that whatever help was sent to the countries under Hitler's control would be seized by him to feed the nazis them selves or to relieve him from the responsibility of feeding his victims.

Labour Problems.—The long quarrel between the A.F. of L. and the C.I.O. showed no signs of abating in 1940, though President Roosevelt urged harmony in the ranks of labour as a necessary contribution to the unity of the nation in the face of its dangers. President Green of the A.F. of L. held to the idea that the younger seceding organization should return to allegiance to the parent body, which maintained the vertical craft union against the horizontal industrial union of the C.I.O. The latter won a notable victory in April, when 129,000 of the 137,650 workers of the General Motors corporation voted on the type of union they preferred for collective bargaining; and the C.I.O. captured 48 unions to only 5 for the A.F. of L. On the other hand, a split was threatened in the C.I.O. because its president, John L. Lewis, dissatisfied with the return which the Roosevelt administration had made for the substantial support of the C.I.O. in the elections of 1936, turned against the president and announced in Jan. 1940 that Roosevelt would meet with "ignominious defeat" if the Democratic party were "coerced or dragooned" into renominating him for a third term. Lewis's candidate was Senator Burton K. Wheeler of Montana, and, when Roosevelt was renominated, he supported the Republican candidate Wendell L. Willkie, declaring that he would resign the presidency of the C.I.O. if Roosevelt were elected. He asserted that government contracts amounting to $3,500,000,000 had been given to firms regardless of their obedience to the regulations of the NLRB. However, powerful unions in the C.I.O., like the clothing and textile workers, supported Roosevelt. At the convention of the C.I.O. at Atlantic City in November, Lewis resigned and was succeeded by Secretary Philip Murray of the United Mine Workers. The convention of the A.F. of L. at New Orleans in the same month re-elected William Green as president. Migratory labour remained a serious problem. Every year some 200,000 of these footloose job seekers flock to California, and New York state spent $3,000,000 in 1940 in caring for needy nonresidents. Figures on unemployment vary widely between 8,000,000 to 9,000,000 estimated by Dorothy Thompson and Arthur Krock and the 12,000,000 claimed by the C.I.O. In spite of the upward turn in production, Welfare Commissioner William Hodson of New York declared on Dec. 22, 1940, that there was little hope that relief expenditures for the unemployed could be reduced. He pointed out that in the metropolitan district of New York the state's unemployment insurance benefits had increased from $55,000,000 in 1939 to $70,000,000 in 1940.

The year saw no such severe strikes as those of the bituminous coal workers and the Chrysler automobile workers in 1939, nor was there any further "strike against the government" such as some skilled workers in the WPA staged in the summer of 1939 against changes in the WPA rules which threatened union standards of wages for work on government projects. But a danger signal was displayed when workers in the plant of the Vultee Aviation corporation in southern California went on strike in November. Since the Vultee factory was playing an important part in the defence program by manufacturing planes which were sorely needed by the government, the question arose whether strikes in plants producing war material should not be forbidden and even the wages and hours act be amended so as to permit overtime work in such plants without extra pay. As in 1916 (a year of an unprecedented number of strikes), the United States was presented with the problem of finding some compromise which would protect labour in its gains of a quarter of a century and at the same time ensure the uninterrupted production of materials necessary for the nation's defence. The problem in 1916 was happily solved by the creation of a War Labor board under the joint chairmanship of ex-President Taft and Frank P. Walsh, which settled over 1,000 industrial disputes and spared President Wilson from exercising the power, conferred on him when the U.S. entered the war, of taking over plants in which labour disputes threatened stoppage of war production. Sidney Hillman, able president of the Amalgamated Clothing Workers union and vice president of the C.I.O., was labour's representative on the National Defense Advisory commission, and to him would fall the special duty of seeking an adjustment of labour's interests to the government's needs.

The NLRB.—Ever since the establishment of the National Labor Relations board in 1935, criticism of its powers and practises, both by employers and workers, by the A.F. of L. and the C.I.O., has been rife. Though the record of the board over the five-year period has been excellent, with 92% of the 28,000 cases involving 6,140,000 workers settled by peaceful agreement, controversy raged over the alleged discriminations of the board in favour of the unions as against the employers and over the alleged favouring of the C.I.O. against the A.F. of L. Early in 1940 Senator Wagner of New York, the original sponsor of the National Labor Relations act, introduced a bill into congress for the establishment of a mediating board of three members in the department of labour, to persuade parties in dispute to accept arbitration. In March a special committee of the house, which had been appointed in 1939 to investigate the activities of the NLRB, reported recommendation of 21 changes in the original act. There was to be a board of three, as Senator Wagner proposed, to judge the cases in dispute. The board was to be compelled to hear complaints from the employers (heretofore optional) as well as from the unions. Restoration of back pay in cases where the board had upheld the strikers' cause was to be limited to six months, and there was to be no rehiring of workers who had practised sabotage. These (Smith) amendments to the NLRA were part of the unfinished business of the 76th congress when it adjourned.

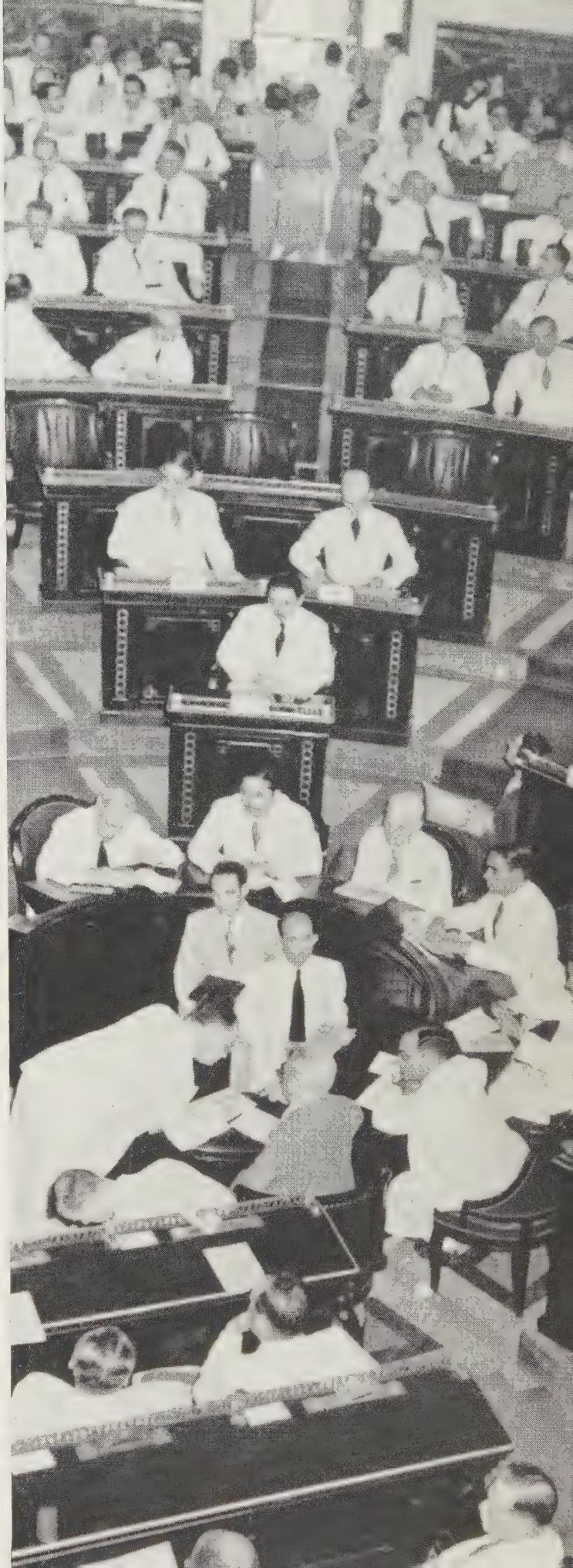
In November Dr. Harry A. Millis, head of the department of economics at the University of Chicago and a former member of the NRA labour board, succeeded J. Warren Madden as chairman of the NLRB.

Transportation.—In spite of increasing competition from automobile, bus, truck and plane, the railroads held their own during 1940, and preserved their enviable record for safety. New streamline trains were added continually, cutting down the run-

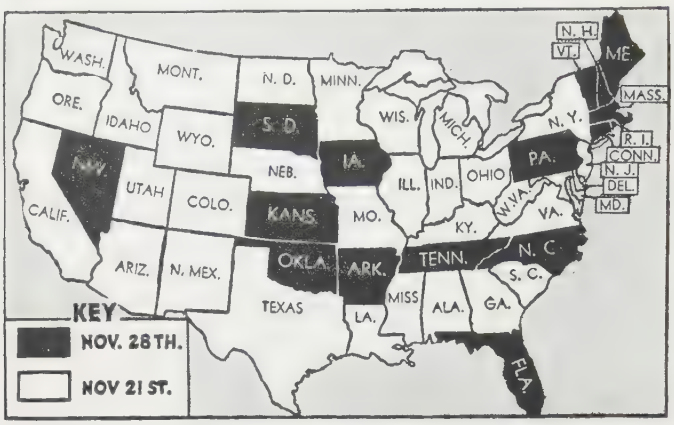
ning time between the large cities. A new feature was the introduction by some of the major roads of de luxe coach trains, like the "Pacemaker" of the New York Central between New York and Chicago, which reduced the fare to less than half that on the Pullman trains, berth included.

In aviation the interest of the government and the people actually centred on the progress of military aeroplanes, in view of the feverish defence activities. But commercial aviation, too, made great strides during the year. New and improved types of planes were built, scores of new routes opened and hundreds of new airports laid out. The Civil Aeronautics authority recommended the construction of 4,000 airports at an estimated cost of $560,000,000. On March 31 the largest seaplane basin in the world, costing $7,500,000, was dedicated at the La Guardia airport on Long Island. By Jan. 1, 1941 there were 58 scheduled trips a day between New York and Chicago, and 38 planes in the Latin-American service arrived at or departed from Miami each week. In June passenger service to Alaska was inaugurated, reducing the time between New York and Juneau from seven days to 24 hours. In July clipper planes began a regular schedule of flights between San Francisco and Auckland, N.Z., covering in four and a half days the 8,000 mi. for which the fast steamers take 17 days. The network of American airlines in the countries south of the Panama canal was growing steadily denser. For the transatlantic clipper service (to Lisbon) which was inaugurated in June 1939, Pan American Airways ordered a new fleet of Super-clippers with a capacity for 50 passengers and 5,000 lb. of mail. Another triumph of Pan American is the Strato-clipper, designed to fly above the clouds at an altitude of approximately five miles, and supplied with devices for heating the rarefied air and conditioning it to human needs. On a test flight from Los Angeles to New York the Strato-clipper cut the time from 15 hr. and 47 min. to 12 hr. and 13 min. The first schedule of the new Clippers went into effect in July with a flight from Miami to Barranquilla, Colombia. An improvement in air-mail service was inaugurated by the introduction of the non-stop pick-up device, by which the low flying planes send down bags of mail on a sort of trolley and take the bags of "outgoing" mail from a wire stretched between two poles. In March the CAA was asked permission by one of the air lines to extend this service to six new routes in the eastern states, which would carry mail directly to about 125 cities and towns. Commercial aviation established a proud record for safety. After the tragedy at Oklahoma City on March 26, 1939, in which eight persons lost their lives, no major accident occurred until Aug. 31, 1940, when an airliner crashed near Lovettsville, Va., killing 25. During the 12 months following the Oklahoma accident the air lines carried 2,028,817 persons 87,325,145 mi.

A growing embarrassment to interstate commerce has been the laws, more than 1,000, enacted by state legislatures to control or prohibit goods entering from other states. For example, dairy states have banned the entrance of margarine in the interest of their own producers of butter; California has excluded oranges and grapefruit from Florida and Texas to protect its own fruit growers. Trucks are not allowed to bring more than a certain quota of gasoline into some states. Thus, on the ground of the protection of health, or for the encouragement of "home industries," or in regulation of highways, or by the legitimate exercise of the taxing power, practically every state in the union has discriminated against its sister states, in spite of the provision of the federal constitution giving to congress the power to "regulate commerce among the several states." The president's Tem-



THE DELEGATES of 21 American republics meeting at Havana July 22-30, 1940, reached rapid agreement on measures to ward off totalitarian threats in the western hemisphere



HOW THE VARIOUS STATES observed Thanksgiving day in 1940

porary National Economic committee investigated this perplexing situation during 1940, in the hope of getting the states to abolish their "ports of entry" and permit the country to become the great domestic free trade area which the fathers intended it to be.

Merchant Marine.—The new United States merchant marine which has been building up since the creation of the maritime commission in 1936 was threatened with a serious setback on the outbreak of the European war. By the Neutrality act, passed by the special session of congress in Nov. 1939, U.S. vessels engaged in foreign trade (more than 300) were barred by presidential proclamation from entering "combat areas," which extended from Norway to Spain. Over 80 vessels regularly sailing for Liverpool, Southampton, Cherbourg, Hamburg, Bremen, Rotterdam and Antwerp and employing some 5,000 seamen, were excluded from those important shipping centres. It looked as if the program of the maritime commission for the construction of 500 ships over a period of 10 years might be rudely interrupted. However, a number of factors combined to relieve the anxiety. Between the outbreak of the war and the spring of 1940, 90 vessels were sold, at advantageous prices to England, France, Greece, Brazil and other countries; many U.S. vessels were transferred to trade with Latin-America and the far east; and substantial increases in freight rates took place. As a result, the midsummer of 1940 saw work progressing on 118 ships for the maritime commission, to cost $300,000,000, and private companies were spending another $40,000,000 for cargo carriers and oil tankers.

Foreign Trade.—United States exports for 1940, thanks largely to the buying of the European Allies, reached the highest level since 1929–30, amounting to approximately $4,000,000,000. During the first two months of the year, for example, the Allies spent $23,000,000 in the United States for planes and engines. Trade with Great Britain increased from 44% of U.S. exports in January to 66% in September, and registered a total of about $1,500,000,000—a gain of 88% over 1939. Owing to the war, the relative rank of U.S. exports was shifted. Aircraft and parts rose from 9th to 4th place and iron and steel products came up from 3rd place to the top.

Imports of $2,500,000,000 featured rubber, coffee, silk, cane sugar and tea among the leaders. On Jan. 26 the commercial treaty of 1911 with Japan (which had been denounced the previous July) was abrogated; but there was no noticeable interruption of the trade which had been supplying the Japanese with more than half their war material. Two months after the expiration of the treaty, Japan concluded a trade pact with Argentina. Secretary Hull's negotiations with the latter country for a reciprocal pact had broken down, and Argentina remained the only Latin-American country to refuse any trade concessions to the United States. The thinly veiled economic hostility of the Argentine to the United States is due partly to the fact that the balance of trade between the two countries runs in U.S. favour by about $15,000,000 a year, and partly to the competition of the chief export commodities, beef and wheat, with U.S. products. Some years ago the United States excluded Argentina's chilled beef from its ports because of the alleged hoof and mouth disease of their cattle; and they were not even permitted to exhibit their beef at the New York and San Francisco fairs. In March the house voted 216 to 168 to renew for another three years Secretary Hull's authority to conclude his reciprocity pacts, and the senate, after a debate of two weeks, concurred. The considerable opposition to the policy both in house and senate was not so much due to dissent from the purpose of the pacts as to the contention that they should be submitted to the senate for ratification.

Social Security.—On Jan. 1, 1940, in accord with the 1939 amendments to the Social Security act advancing the date from Jan. 1, 1942, the first payments from the social security fund to persons of 65 who were covered by old-age insurance were made. Workers who had contributed 1% of their wages or salaries to the fund since 1937 were to receive an average of $20 to $25 a month. The amendments had also continued the 1% assessment on workers and employers until 1943, in place of the original clause to advance the rate to 1½% in 1940; and extended the benefits of the act to various classes of workers heretofore excluded, as well as to their wives, widows and children. Altogether about 45,000,000, or a third of the population, were in 1940 eligible to participate in the social security program. Senator Wagner of New York, who has been the foremost champion of labour and social legislation in the administration, proposed a health bill providing for the building of hospitals and health centres, for which he would have the government appropriate $80,000,000 the first year, with annual increases to reach the figure of $850,000,000 in ten years. It is a utopian program. The president has not shown much interest in it, as might be expected from the state of the budget, and the American Medical association remains generally hostile to the introduction of socialized medicine.

Housing.—A major problem ever since the beginning of the depression has been the shortage of houses and apartments at a rental within the capacity of poor families to pay. The close relation of disease and crime to inadequate housing is everywhere recognized. It is estimated that slums in United States cities are directly responsible for 75% of the juvenile delinquents, and in many rural areas, especially in the south, families live in shacks and huts that are hardly fit for animals. A report of the United States Housing authority's administrator Nathan Straus, in Dec. 1939, showed that nearly 10,000 substandard dwellings in 26 states had been replaced and that over 125 new projects of the sort were under way. But only a few of the new accommodations (perhaps 15%) were within the means of the vast majority of urban workers living on incomes of less than $2,000 a year. The report stimulated great interest in housing, as illustrated by a series of 13 weekly broadcasts over Columbia Broadcasting System beginning March 24, 1940, entitled "Roof Over America." In the same month of March the USHA inaugurated a program for the construction in six rural counties in Arkansas, Georgia, Illinois, Indiana, Mississippi and South Carolina, of 1,300 farm dwellings at a cost of $2,000 each, to rent for $50 a year—a program made possible by the addition of $800,000,000 to the USHA's funds by act of congress in 1939. Of course, the 1,300 habitable farm buildings would be but a drop in the bucket, compared with the 3,000,000 such dwellings which the Farm Security administration says are needed.

The housing problem was rendered more serious by the sudden

demands made by the program of national defence. Camps had to be built for the hundreds of thousands of men to be called up by the draft. Other hundreds of thousands flocking to the shipyards, the machine shops and the aircraft factories had to be housed. Men were in 1940 sleeping in hallways and cellars at the Norfolk shipyards. A government arsenal at Rock Island, Ill., increased its pay roll from 1,000 men in 1933 to 5,000. The Glenn Martin aircraft plant outside Baltimore, Md., secured funds from the federal housing authority to construct 200 dwelling units for its new workers, and about $2,000,000 was lent by the FHA to build dwellings near the army and navy air stations at Montgomery, Ala. and Pensacola, Fla. It is estimated that the cost to the government of housing the new workers on the defence program will amount to $700,000,000, a part of which the government hopes to recover when peace comes by the sale of the dwellings to private investors. (*See* also HOUSING.)

National Defence.—Although the size of the U.S. military and naval establishments necessary for the defence of the country on both the Atlantic and the Pacific fronts was a perennial question, it was not until Hitler started his *Blitzkrieg* with the invasion of the Low Countries in May that the danger to the United States in case of his subjugation of Europe became manifest. On May 28, 1940, as France was succumbing to Hitler's drive, President Roosevelt set up a Council of National Defense patterned somewhat on President Wilson's council of 1916. It consisted of six cabinet members (war, navy, agriculture, interior, commerce and labour) with an Advisory commission of seven industrial experts, headed by William S. Knudsen, president of the General Motors corporation. Seven months later, as defence preparations were lagging, a White House parley advised a smaller "super-commission" to be known by the cumbrous title of Office for Production Management for Defense, later called Office of Production Management. Mr. Knudsen was continued as chairman, and to him were added Secretaries Stimson and Knox and Sidney Hillman. The original commission, however, was not disbanded. The council of 1916 had been converted into the War Industries board early in 1918; but President Roosevelt, declaring that the business of rearming America was "too large and complex a job for any one man," made the categorical statement that there would be no "defence czar" in the present crisis. The four members of the new commission were to have full power to determine policy regarding production of war material, purchases and priorities—subject, of course, to the president's supervision. The authority for the establishment of the commission was derived from the Reorganization act passed by congress in 1939.

On May 10, the very day that Hitler invaded the Netherlands, the president, speaking before the eighth American Scientific congress at Washington, indulged in the most outspoken criticism of the totalitarian powers since his "quarantine" speech at Chicago in Oct. 1937. He declared that "we Americans of the free Americas" were "shocked and angered by the tragic news" from Europe, which held the warning that America was not safe. At the same time he asked congress for a third $1,000,000,000 for defence, declaring that 50,000 planes a year (or four times the normal rate of production) were necessary for the protection of the western hemisphere. On June 10, at the University of Virginia, he attacked the dictator governments for their appeal to "the gods of force and hate," and scored Mussolini for entering the war to give France a stab in the back just as the French army was about to capitulate to Hitler. Again, in his Columbus day speech (Oct. 12) he defied the axis powers, which Japan had joined in an offensive and defensive alliance, and asserted: "No combination of the dictator countries of Europe and Asia will stop the help we are giving to almost the last free people now fighting to hold them at bay." All aid to Britain short of war was the slogan which won the assent of the majority of the people of the United States. Two obstacles, however, stood in the way of help. The government of a neutral nation could not furnish military aid to a belligerent power, and the Johnson act of 1934 forbade making loans to countries that had defaulted on the debts they owed the U.S. from the World War of 1914–18. President Roosevelt, however, found ways of circumventing both of these obstacles. In September, as commander-in-chief of the navy, he made a deal with the British, by which he delivered to them 50 superannuated but useful destroyers in return for a 99-year lease on eight British locations suitable for naval bases on the Atlantic coast from Newfoundland to British Guiana. There was criticism of the president's action, both on the ground that it was taken without consulting congress and that the transfer of the destroyers would weaken U.S. naval defence. But public opinion supported the president. As for the Johnson act, it might, of course, be repealed as many wished, but, if not, there was still a way of helping Britain without making direct money loans. The president suggested encouraging the British to secure credits in the United States to the amount of $3,000,000,000, which was a virtual guarantee of the debts incurred. Like the destroyer deal, this policy looked toward eventual defence. (*See* also DEFENCE, NATIONAL.)

The Navy.—The navy is the first line of defence, and it is the branch of the service in which President Roosevelt is most interested. The budgetary provisions of more than $1,000,000,000 for the navy in January, though the largest in United States history, were seen to be inadequate if the United States was to have the "two-ocean navy" capable of defending both the Atlantic and the Pacific coasts. A naval expansion bill, urged by Secretary Charles Edison, called for 100 more ships at a cost of $1,300,000,000, to bring the totals to 18 battleships, 11 aircraft carriers, 53 cruisers, 88 submarines and 200 destroyers, 167 of the latter being in 1940 "over-age." In April congress approved two additional battleships of 45,000 tons. These floating fortresses, the "Iowa" and the "Missouri," were to be equipped with nine 16-in. guns mounted on triple turrets and to have a speed of 38 knots. The work on the "Iowa" was being speeded up and the keel of the "Missouri" was to be laid in the Brooklyn yards early in 1941. On July 20 the president signed a new bill authorizing

ADVISORY COMMISSION of the U.S. national defence council appointed by President Roosevelt May 28, 1940. Left to right: Chester C. Davis, Harriet Elliott, William S. Knudsen, Edward R. Stettinius, Jr., William McReynolds and Ralph Budd. Leon Henderson and Sidney Hillman are also members. Mr. Knudsen on Dec. 20 became director of a new "super-defence" board, and Sidney Hillman was later named associate director

a 70% increase in naval strength, 92 of the previously authorized vessels being in 1940 under construction. The U.S. was rapidly approaching in 1940 the $4,000,000,000 naval program recommended by Admiral Harold Stark. The 200 ships authorized by the new act would raise United States fighting strength by 1946–47 to 35 battleships, 88 cruisers, 150 submarines and 378 destroyers. According to Senator Walsh, chairman of the committee on naval affairs, the cost of providing the plant expansion for building the great two-ocean navy, the necessary bombs, shells, torpedoes and planes, the seamen, officers and pilots, would reach the staggering sum of $10,000,000,000. A bill to speed up naval construction was passed by congress in June, giving the president the power (unprecedented in peacetime) to take over and run under government operation any manufacturing plant that he considered necessary for national defence. Partly in order to provide room for the passage of the largest war vessels and partly as an added protection to a vital spot in naval defence, construction was planned to begin on a third set of locks at Panama, 200 feet longer and 25 feet wider than the present locks, and situated about three-quarters of a mile from them. This new passageway from the Atlantic to the Pacific would cost approximately $275,000,000. It would be completed in about 6 years.

Aircraft.—Planes have assumed a greater importance in this war than any other instrument of destruction. No part of the U.S. defence program was so widely criticized for inefficiency and lagging as was the aircraft production—or lack of production. In May 1940 the United States had about 5,000 planes but according to Chief of Staff General George C. Marshall not more than 1,500 of these were suitable for use. In Sept. 1940, after the war had been going on for a year, the United States was building fewer than 1,000 planes a month, though it was hoped that the number would be raised by 50% early in 1941. Controversy was sharp over the question whether planes could be produced in mass like automobiles or whether the machine tools used in the manufacture of autos could be adapted to plane production. The National Defense Advisory commission reported in September that when the proper tools were installed in the factories the production of planes would be speeded up to 3,000 a month (by the end of 1941). The Reconstruction Finance corporation had already loaned the Wright Aeronautical company $92,000,000 for a factory to build 12,000 aeroplane engines a year. On Dec. 23 Philip Murray, the new president of the C.I.O., lunched with President Roosevelt and submitted to him a proposal to begin mass production of planes at once, by converting the unused capacity of the automobile plants (like the idle Hupmobile factory) into plane plants, and promised 500 planes a day when the peak of production should be reached in 1942. But Mr. Murray's proposal, though favourably commented on by the president, was regarded by the experts who were familiar with the difficulties of plane production rather as a token of labour's readiness to contribute its utmost to the program of national defence than as a feasible scheme. A further subject of controversy was the disposition of the planes: Should a large number of them be shipped to Europe to help the Allies, or not? In 1940 the United States was sending abroad approximately one-third of the planes manufactured. Statistics show that, whereas in Aug. 1939 exports of aircraft and parts amounted to $12,000,000, by Aug. 1940 the figure had mounted to $36,500,000, Great Britain taking the major part.

Conscription.—The question of universal military training has been agitated almost continually since the World War of 1914–18. Its advocates have seen it as a necessary step in preparing the nation for an eventual war to preserve democracy, while opponents have feared that it would be the entering wedge of militarism. The change in popular sentiment on this question, as the danger of a complete Hitler victory loomed larger, was registered by the Gallup polls. Soon after the Munich conference of Sept. 1938 only 37% of the voters in the polls favoured universal military training. With the opening of the blitzkrieg in the west in the spring of 1940 the figure had increased to 50%; and after the Germans entered Paris on June 14 the poll showed 64% of the voters in favour of conscription. On the 20th of the same month E. R. Burke of Nebraska introduced a bill for conscription into the senate, and on the next day the bill was presented to the house by Representative James Wadsworth of New York. The bill was patterned on the Selective Service act of 1917, and stated in section 2 that "to insure the independence and freedom of the United States" it was "imperative that immediate measures be taken to mobilize the nation's strength," and that adequate forces could not be raised by voluntary enlistments. At the same time a joint resolution of congress, effective until June 30, 1942, empowered the president to order the national guard (242,000 officers and men) and the regular army (about 300,000) to active duty. The senate and house bills on conscription differed in respect to the age of registrants, the number to be drafted, the conscription of industry and other minor matters. But after a debate of three months the Selective Training and Service act was passed by a majority of two to one in both houses on Sept. 14, 1940 and signed by the president. (*See* SELECTIVE SERVICE.)

"ACH! YOU'RE JUST SEEING THINGS under the bed," says Hitler in this cartoon by Herblock of NEA Service on the subject of Fifth Columns

Hemisphere Defence.—The danger of a complete nazi victory in Europe has aroused the United States to a concern not only for its own safety, but for the protection of the whole western hemisphere. Since the Declaration of Lima in Dec. 1938, three months after the Munich "appeasement," several important steps had been taken to create an all-American front against the dictators. In the spring of 1939 President Roosevelt declared that the United States was ready, by force if necessary, to help the Latin-American countries maintain their independence against foreign aggression and the propaganda of nazi and fascist agitators within their borders. After the European war broke out the American republics agreed to establish a neutral zone extending 300 mi. from

their coasts and warned belligerent vessels to refrain from engagements therein. When Holland and France succumbed to Hitler the danger of nazi aggression in the hemisphere became acute, for both those countries have important colonial possessions in the Caribbean region which might serve as German bases for an attack on South America or on the Panama canal, the latter being only 750 mi. from the Dutch island of Aruba with its gigantic oil refineries. The senate, by a unanimous vote (78 to 0), resolved to prohibit the transfer of any territory in the western hemisphere from one non-American power to another; and a conference of American foreign ministers at Havana in July established a joint trusteeship over European colonies in the hemisphere and agreed that, in case of the attempt of Germany to seize any of those colonies, any American republic which felt itself threatened might take over the colony by force. Furthermore, in order to detach the Latin-American states from their economic dependence on Europe, President Roosevelt on the second day of the conference asked congress for an increase of $500,000,000 in the capital of the Export-Import bank and later in the year proposed the formation of a $2,000,000,000 inter-American corporation, financed largely by the United States, to give economic aid to the Latin-American states by encouraging their self-sufficiency in production and even purchasing their surpluses. The difficulty of such a scheme, however, becomes apparent when it is remembered that from 1930–40 65% of Latin-American exports, or one-third of their production, has gone to European countries, and that great numbers of the 15,000,000 Germans, Italians and Japanese in Latin America sympathize with the nazi program, to say nothing of the other millions who fear "Yankee" economic imperialism quite as much as the German type, or of United States producers of the agricultural commodities which furnish the bulk of the exports of those countries, who would resent the intrusion

"LET COME WHAT MAY." An unencouraging view of U.S. preparedness in 1940, by Carlisle of the *Des Moines Register*

MORE THAN 200 NEW U.S. CITIZENS took the oath of allegiance simultaneously before a federal judge in Detroit March 11, 1940

of such commodities into the United States. It is obviously not easy under these conditions to create an all-American front; but still the increasing danger of the encirclement of America by nazi bases reaching from (Danish) Greenland around to (French) Guiana, with the (Portuguese) Cape Verde islands nearer to the South American coast than New York is to St. Louis, may yet unite the wavering Latin-American states in a hearty co-operation with their northern neighbour for the common defence of the western hemisphere. (See HISPANIC AMERICA AND THE EUROPEAN WAR.)

Latin-American Relations.—Apart from the problems discussed in the preceding paragraph, there is little to say on United States relations with Latin America. On July 7 General Manuel Avila Camacho, the candidate of the Popular Front, defeated General Juan Almazán for the presidency of Mexico in an election which cost 47 lives. U.S. vice-president-elect Henry A. Wallace attended the inauguration ceremonies in December. In contrast with improved relations with Mexico, friction with Argentina, due largely to economic rivalry, has been disturbing. However, relations with the latter country were bettered toward the close of the year by the advance of a $50,000,000 credit for the purchase of goods in the United States and of another $50,000,000 to help stabilize Argentina's currency. Efforts to bring the Latin-American republics into closer cultural relations with the United States were constant. In the summer of 1940 more than 50 American students attended the University of San Marcos (the oldest on the American continents) at Lima, Peru, and others went to the universities of Bogota in Colombia and Chile at Santiago. In return, many Latin-American students who in normal times would have gone to the universities of Europe went to the United States, about 1,400 of them having registered at 158 universities during the year 1940. It is expected that the 11,500-mi. highway from New York to Buenos Aires (8,200 mi. of which were open in 1940) will be completed by 1942, furnishing a new link, together with the rapidly thickening net of airways, to bind the two continents of the hemisphere together.

Foreign Relations.—The war determined the trend of United States foreign policy in 1940, just as it dictated the defence program. At the beginning of the year, before Hitler had invaded Scandinavia, the Low Countries and France, the United States was chiefly concerned with maintaining a strict neutrality which should keep it out of war. But as the year closed, with Britain fighting desperately to preserve the democratic way of life,

isolationism changed into a determination to aid Britain short of actually entering the war. On the evening of Dec. 29, 1940, President Roosevelt spoke to the American people (and the whole world) from the White House, declaring that never since Jamestown and Plymouth Rock had American civilization been in such danger, that "the masters of Germany have made it clear that they intend to enslave the whole of Europe and then to use the resources of Europe to dominate the rest of the world." He asserted that "the United States has no right or reason to encourage talk of peace" until the axis powers are defeated, and he called upon the nation to unite in pushing the defence program "without interruption by strikes or lock-outs." Neutrality was wearing thin. United States citizens who did not agree with the president's words believed that the U.S. was headed for war. The isolationist Senator Hiram Johnson, on leaving California to begin his fifth term at Washington, said he was "off to the war." The Johnson act still stood on the books; but the United States was about to "evade" it by guaranteeing huge credits to Britain, should it need them. The Neutrality Act of 1939 had not been repealed; but the United States had already sent 50 destroyers to Great Britain. Sentiment was stirring that the 500,000 tons of Danish, German, Italian, Dutch and French merchant ships immobilized in United States ports should be seized and delivered to Britain—a procedure which Berlin warned would be an act of war. On Feb. 9 the president sent Undersecretary of State Sumner Welles to Europe to report to him on the situation in England, France, Germany and Italy. Welles was politely but coolly received in the totalitarian states, and heard Hitler's demand for the end of "British imperialism," the return of the German colonies and nazi domination over Czechoslovakia, Poland and Hungary. The reiterated demands of Hitler persuaded the "interventionists" (including the president) that safety for the United States lay in the defeat of the axis powers. "If the Allies lose this war," said Dorothy Thompson in June, "it will prove to be the worst catastrophe for the United States in our whole history." "To ask that we be neutral in this war is the height of folly," said William Allen White. On the other hand, the "isolationists," like Lindbergh, General Robert E. Wood and Senators Taft, Vandenberg, Walsh and Johnson, while advocating the maximum arming for defence, were firm in the opinion that the United States should refuse to become involved in the European conflict.

Japan continued to be a source of anxiety in the far east. In September its armies invaded French Indo-China (a country of 23,000,000 people, rich in rubber, coal, tungsten and other minerals), with the apparent purpose of establishing bases for attack on the East Indies or on China proper. The United States immediately put an embargo on scrap iron and steel, and Japan replied by signing a triple alliance with Germany and Italy at the chancellery at Berlin (Sept. 27). The alliance was evidently aimed at the United States, and the Japanese foreign minister Matsuoka, though declaring that his country wished to avoid any conflict with the United States, acknowledged that if the United States should go to war with the axis powers Japan would have to join the fight against the U.S.

Secretary Hull flatly told the Japanese ambassador at Washington that "a showdown would have to come if Japan persisted in her present course."

Total Presidential Votes by Parties—1940, 1936, 1932
(Copyright, 1940, by The Associated Press)

Party	1940	1936	1932
Democratic	27,245,422	27,751,597	22,821,857
Republican	22,333,801	16,679,583	15,761,841
Socialist	116,796	188,014	884,781
Prohibition	58,600	37,661	81,869
Communist	48,789	80,159	102,991
Socialist Labor	14,861	12,508	33,276
Other votes	413	897,595	129,907
Total vote	49,818,682	45,647,117	39,816,522

Presidential Vote by States, 1940
(Copyright, 1940, by The Associated Press)

State	Roosevelt, Democratic	Willkie, Republican	Thomas, Socialist	Babson, Prohibition	Browder, Communist	Aiken, Soc. Labor
Alabama	250,726	42,184	100	700	509	..
Arizona	95,267	54,030	..	742	..	..
Arkansas	158,622	42,121	305	793	..	..
California	1,877,618	1,351,419	16,506	9,400	13,586	..
Colorado	265,364	278,855	1,905	1,599	376	..
Connecticut	417,621	361,819	..	..	1,091	971
Delaware	74,599	61,390	129	207	..	..
Florida	360,407	126,412	..	..	..	..
Georgia	265,194	46,362	..	983	..	..
Idaho	127,835	106,555	497	..	269	..
Illinois	2,149,934	2,047,240	10,914	9,190	..	..
Indiana	874,063	899,466	2,075	6,437	..	706
Iowa	578,800	632,370	..	2,284	1,524	452
Kansas	364,725	489,160	2,347	4,056	..	..
Kentucky	557,222	410,384	1,014	1,443	..	..
Louisiana	319,751	52,446	..	..	..	..
Maine	156,478	163,951	..	..	411	..
Maryland	385,546	269,544	3,967	..	1,216	635
Massachusetts	1,076,522	939,700	4,091	1,370	3,806	1,492
Michigan	1,032,991	1,039,917	7,593	1,795	2,834	795
Minnesota	644,196	596,274	5,454	..	2,711	2,553
Mississippi	168,267	7,364	193	..	..	..
Missouri	958,476	871,009	2,226	1,809	..	209
Montana	145,698	99,579	1,443	664	489	..
Nebraska	263,677	352,201	..	..	..	..
Nevada	31,945	21,229	..	..	..	..
New Hampshire	125,292	110,127	..	..	..	..
New Jersey	1,016,404	944,876	2,823	851	8,814	446
New Mexico	103,699	79,615	144	100	..	..
New York	3,251,918	3,027,478	18,950	3,250	..	..
North Carolina	609,015	213,633	..	..	..	..
North Dakota	124,036	154,590	1,279	325	545	..
Ohio	1,733,139	1,586,773	..	..	..	..
Oklahoma	474,313	348,872	..	3,027	..	..
Oregon	258,415	219,555	398	154	191	2,487
Pennsylvania	2,171,035	1,889,848	10,967	..	4,519	1,518
Rhode Island	181,122	138,214	..	..	..	..
South Carolina	95,470	4,360	..	2	..	..
South Dakota	131,362	177,065	..	..	..	..
Tennessee	351,601	169,153	463	1,606	..	..
Texas	840,151	199,152	728	925	212	..
Utah	154,277	93,151	198	..	191	..
Vermont	64,269	78,371	..	..	404	..
Virginia	235,961	109,363	282	882	71	48
Washington	462,145	322,123	4,586	1,686	2,626	667
West Virginia	496,146	372,662	..	..	..	..
Wisconsin	704,821	679,206	15,071	2,148	2,394	1,882
Wyoming	59,287	52,633	148	172	..	..
Totals	27,245,422	22,333,801	116,796	58,600	48,789	14,861

The Election of 1940.—For the presidential election details *see* DEMOCRATIC PARTY; ELECTIONS; REPUBLICAN PARTY.

Changes in Personnel.—The end of the year saw only three members of Roosevelt's original cabinet in office (secretaries Hull, Ickes and Perkins). The resignations of secretaries Edison and Woodring of the navy and war departments were followed by the appointment of two noted Republicans, Frank Knox of Chicago and Henry L. Stimson of New York to their respective posts.

Harry Hopkins (commerce), James A. Farley (postmaster general) and Henry Wallace (agriculture) left the cabinet, to be replaced respectively by Jesse Jones, Frank Walker and Claude Wickard.

Frank Murphy (attorney general) was appointed to the supreme court to succeed Pierce Butler, and Robert Jackson took Murphy's place. Admiral William D. Leahy, former governor of Puerto Rico, was sent in December as ambassador to the Vichy government in France.

(*See* also ANTI-SEMITISM; CANADA; DEMOCRACY; INTERNATIONAL LAW; JAPAN; MEXICO; NEUTRALITY; PROPAGANDA; PUERTO RICO; ROOSEVELT, FRANKLIN DELANO; VIRGIN ISLANDS.)

(D. S. MU.)

Transportation.—For statistics on transportation and communications *see* the articles AVIATION, CIVIL; ELECTRIC TRANSPORTATION; MOTOR TRANSPORTATION; MOTOR VEHICLES; POST OFFICE; RAILROADS; SHIPPING, MERCHANT MARINE; TELEPHONE.

Agriculture.—Production in 1940 was well above the 1929–38 average, and most crops were also above the output average of the previous year. The total acreage for harvest in 1940 was estimated at 315,909,000, a slight increase over the 311,921,000

Table I.—*Production Figures of Selected U.S. Crops, 1932–40*
(000's omitted)

Year	Corn	Oats	Wheat	Cotton	Cottonseed	Tame Hay	Rice	Tobacco	Potatoes
1932	2,931,281 bu.	1,250,955 bu.	756,927 bu.	13,003 bales	5,784 tons	71,827 tons	41,619 bu.	1,017,317 lbs.	376,425 bu.
1933	2,399,632	733,166	551,683	13,049	5,806	66,530	37,651	1,371,131	342,306
1934	1,461,123	542,306	526,393	9,636	4,282	55,270	39,047	1,081,629	406,105
1935	2,303,747	1,194,902	626,344	10,638	4,729	78,138	38,784	1,297,155	386,380
1936	1,507,089	785,506	626,766	12,399	5,511	63,536	49,002	1,154,131	331,918
1937	2,044,995	1,146,258	873,993	18,946	8,426	73,785	53,364	1,553,405	393,289
1938	2,542,238	1,053,839	930,801	11,943	5,400*	80,299	52,303	1,378,534	371,617
1939	2,619,137	937,215	754,971	11,817	..	75,726	52,306	1,848,654	364,016
1940*	2,433,523	1,218,273	792,332	12,686	..	84,504	51,924	1,319,946	393,931

* Preliminary.

ac. harvested in 1939. Excellent crops were reported for oats and barley, whereas corn and rye showed decreases among the grains. Tobacco, suffering from export losses, was below its 1929–38 average of production; the acreage for harvest was only 1,437,000 as compared with 2,014,000 in 1939. The production of feed grains for all purposes was estimated at 98,500,000 tons. Table I shows the production figures of selected crops since 1932.

Shipments of cattle at public stockyards through Oct. 1940 were 5,078,000 (4,990,000 in the same period for 1939); calves, 2,179,000 (2,276,000); hogs, 7,352,000 (5,735,000); sheep and lambs, 9,666,000 (10,304,000).

Table II lists average prices received by farmers for important crops on selected dates (all in cents).

Table II.—*Farmers' Average Prices, Certain U.S. Crops, on Selected Dates*
(in cents per unit)

	Wheat per bu.	Corn per bu.	Oats per bu.	Barley per bu.	Rye per bu.	Buckwheat per bu.	Potatoes per bu.	Eggs per doz.	Cotton per lb.
Oct. average, 1909–13	88.1	64.8	38.4	60.5	72.0	71.1	65.0	23.8	12.10
Oct. 15, 1936	106.8	97.9	43.1	84.2	80.4	78.3	97.9	27.6	12.23
Oct. 15, 1937	88.7	58.9	28.8	52.0	63.8	62.4	48.5	25.2	8.10
Oct. 15, 1938	52.2	41.9	22.1	36.1	32.9	54.5	51.0	27.1	8.53
Oct. 15, 1939	70.3	47.6	30.3	42.2	45.1	62.7	66.4	22.9	8.73
Oct. 15, 1940	68.2	59.4	28.3	38.2	40.5	54.4	52.0	23.7	9.35

See also AGRICULTURE and the articles on individual agricultural products.

Manufactures.—The preliminary report of the department of commerce's census of manufactures for 1939, issued Jan. 15, 1941, estimated the number of establishments at 184,244, salaries and wages at $11,631,967,995 and value of products at $56,828,807,223. The leading industrial groups with their values of products were as follows: food ($10,603,950,671), iron and steel ($6,591,530,456), motor cars ($4,047,872,729), textiles ($3,897,437,872), chemicals ($3,733,657,723) apparel ($3,358,255,400), machinery, except electrical ($3,254,173,950).

Labour.—For data on labour in 1940, *see* the articles AMERICAN FEDERATION OF LABOR; CONGRESS OF INDUSTRIAL ORGANIZATIONS; LABOUR UNIONS; RELIEF; SOCIAL SECURITY; STRIKES AND LOCKOUTS; UNEMPLOYMENT; WAGES AND HOURS.

Foreign Commerce.—In 1940 the United States had the largest favourable balance of trade since 1921. Exports through November totalled $3,703,099,000 and imports $2,371,982,000, leaving an export balance of $1,331,117,000 for the first 11 months, as compared with a balance of $737,857,000 in the same period of 1939 and $1,036,415,000 in the same period of 1938. Table III shows foreign trade in merchandise for the first 11 months of 1939 and 1940 by continents.

Table III.—*U.S. Foreign Trade in Merchandise, by Continents, First 11 Months of 1939 and 1940*

U.S.A.	Europe	N. America	Asia	S. America	Africa	Oceania
1939 exports	$1,128,877	$729,759	$491,817	$285,159	$103,770	$70,191
imports	559,963	530,535	609,859	279,808	66,684	24,346
1940 exports	1,531,908	970,165	567,106	403,760	144,057	86,104
imports	363,724	634,071	883,120	346,942	117,492	26,633

Exports to the United Kingdom through Nov. 1940 amounted to $908,648,328 as compared with $454,703,418 in 11 months of 1939. Only nominal exports were being shipped to France by the end of the year, but the U.S.A. continued to import from that country at approximately a third of the 1939 rate. Exports to Germany likewise approached the vanishing point.

Iron and steel products and industrial machinery both displaced petroleum as the leading U.S. exports in 1940. Aircraft and aircraft parts rose from ninth in value to fourth. Coal also showed a notable increase, whereas tobacco dropped from $86,145,000 in Jan.-Nov. 1939 to $52,530,000 in Jan.-Nov. 1940. Rubber was again the leading import, followed by non-ferrous metals, paper and sugar. Coffee dropped from third place to sixth in import values in 1940.

Table IV.—*Leading U.S. Exports and Imports—through Nov. 1940*

Exports		Imports	
Products	Value	Products	Value
Iron and steel products	$532,757,342	Rubber and manufactures	$284,998,044
Industrial machinery	404,550,904	Non-ferrous metals*	248,331,720
Petroleum and products	292,281,636	Paper and products	122,495,557
Aircraft and parts	279,646,097	Sugar and products	121,703,531
Cotton and products	278,840,205	Silk and products	120,546,212
Motor cars and parts	229,838,068	Coffee	114,792,426
Non-ferrous metals*	200,389,508	Wool, mohair, etc., prod's	94,672,445
Electrical machinery	106,921,990	Furs and manufactures	70,760,316
Coal and coke	82,986,262	Paper base stocks	70,400,878
Grains and preparations	73,216,286	Petroleum and products	63,200,383
Agricultural machinery	71,793,548	Jute and products	53,326,682

*Except precious.

Table V.—*Total U.S. Imports and Exports 1932–40*
(000's omitted)

Year	Export Total	% Increase	Import Total	% Increase
1932	$1,611,016	..	$1,322,774	..
1933	1,674,994	3.9	1,449,559	9.6
1934	2,132,800	26.5	1,655,055	14.2
1935	2,282,874	7.0	2,047,485	23.8
1936	2,455,978	7.6	2,422,592	18.3
1937	3,349,167	36.4	3,083,668	27.2
1938	3,094,440	−7.6	1,960,428	−36.4
1939	3,177,176	2.7	2,318,081	18.2
1940*	3,703,099	31.8	2,371,982	14.5

*11 months; percentages of increase compared with 11 months of 1939.

Mineral Products.—Statistical information on the mineral industry released by the bureau of mines of the U.S. department of the interior in 1940 pertained to the year 1939 (*see* also separate articles on minerals and metals). According to preliminary estimates, the total value of all mineral production in that year was $4,874,000,000, an increase of 12% over the $4,362,900,000 of 1938. In 1937 the value was $5,413,400,000. Metals as a group were mostly responsible for the increase in value of production in 1939, the value of non-metallic minerals being only slightly above the $3,471,000,000 of the preceding year. Pig

Table VI.—*Leading Mineral Products of the U.S., 1938 and 1939*

Mineral	1938 value	1939 value
Petroleum	$1,373,060,000	$1,265,000,000
Bituminous coal	678,653,000	732,534,000
Pig iron	356,875,369	626,824,690
Natural gas	500,698,000	539,625,000
Coke	167,181,834	212,884,050
Gold	178,143,400	196,391,000
Pennsylvania anthracite	180,600,167	187,175,000
Cement	156,703,002	184,254,932
Iron ore	74,322,405	158,511,338
Stone	139,255,046	158,461,515
Copper (domestic ores only)	110,216,000	148,236,000

iron rose sharply from $356,875,000 to $626,825,000, as did iron ore—from $74,322,000 to $158,511,000. The leading mineral products of the U.S.A. in 1938 and 1939, each with an output value of more than $100,000,000 in the latter year, are shown in Table VI, on p. 691.

Finance and Banking.—Statistics pertaining to the United States will be found in separate articles such as BANKING; BONDS; BUDGETS, NATIONAL; FINANCIAL REVIEW; GOLD RESERVES AND GOLD STANDARD; NATIONAL DEBTS; NATIONAL INCOME; STOCK EXCHANGES; STOCKS; TAXATION; WEALTH AND INCOME, DISTRIBUTION OF.

Defence.—The year 1940 saw the greatest peacetime military activity in the nation's history and the introduction of selective service.

For more complete details *see* DEFENCE, NATIONAL. At the end of 1940 the actual strength of the U.S. army by components was as shown in Table VII.

Table VII.—*U.S. Army Strength, by Components, Dec. 31, 1940*

	Commissioned Officers	Warrant Officers	Enlisted Men	Totals
Regular Army*	14,325	668	415,472	430,465
National Guard†	9,235	89	130,574	139,898
National Guard‡	9,773	118	120,912	130,803
Selective Trainees	—	—	19,259	19,259
Organized Reserves§	123,822	—	6,437	130,259
Regular Army Reserves	—	—	29,021	29,021
Aggregate	157,155	875	721,675	879,705

*Includes retired personnel on active duty. †In federal service. ‡In state service. §Of this number 24,058 were on active duty Dec. 31, 1940.

Expenditures of the U.S. war department for the fiscal year ended June 30, 1940 were $915,914,102. The U.S. navy at the end of the fiscal year 1940 had 139,554 enlisted men and 10,817 line officers on the active list.

The U.S. marine corps had an average enlisted strength of 25,000 men during the year.

Recorded expenditures of the department of the navy for the fiscal year 1940 were $885,769,793.59 as compared with $660,206,184.96 in 1939.

Table VIII shows a summary of U.S. vessels as of June 30, 1940.

Table VIII.—*Summary of U.S. Naval Vessels, as of June 30, 1940*

	Number (including over-age)	Building
Battleships	15	10
Aircraft carriers	6	5
Cruisers	37	21
Mine vessels	36	4
Destroyers	225	61
Submarines	101	41

The battleships under construction on Dec. 31, 1940 were the "North Carolina," "Massachusetts," "Iowa," "Wisconsin," "Washington," "Indiana," "New Jersey," "South Dakota," "Alabama" and "Missouri." The numerical strength of the U.S. navy at the end of 1940 is discussed in the article NAVIES OF THE WORLD.

For additional data on the U.S. armed forces *see* AIR FORCES; ARMIES OF THE WORLD; MARINE CORPS; NATIONAL GUARD.

United States Antarctic Service: *see* EXPLORATION AND DISCOVERY.

United States Government Departments and Bureaus: *see* GOVERNMENT DEPARTMENTS AND BUREAUS. Also *see* under specific name, *i.e.* COAST GUARD, U.S., etc.

United States Housing Authority: *see* HOUSING; MUNICIPAL GOVERNMENT.

United States Mint: *see* COINAGE.

Universities and Colleges. The growing tensions of the European war were reflected in the activities of United States colleges and universities. Students were active in considering war issues as debated in congress and elsewhere. On the whole, there was general concurrence in the defence program of the selective draft. The U.S. Civil Aeronautics authority organized courses for the training of civilian fliers in hundreds of institutions. These attracted a large number of students. Engineering colleges responded to the request of the government for intensive short training courses in skills essential to the defence program. Many medical colleges organized their hospitals into base units for the United States army or navy. The National Research council made a personnel inventory of the intellectual resources of the country for a scientific program of defence. This included academic staff members and advanced graduate students.

Attendance in the recognized colleges and universities remained stable, although a slight reduction (2%) appeared in freshman registration which might presage some decline in future enrolment. The steady decline in elementary-school enrolment figures, which for several years obtained throughout the country, was in 1940 being reflected in high school attendance records. It was to be expected that this decline would later and further affect college enrolments.

The National Youth administration continued its policy of providing for the employment of a limited number of college students compelled to work to support themselves during the college course. In 1940, 170,000 students were thus assisted. Notable additions to physical plants were made at the publicly supported universities of Wisconsin, Minnesota, Purdue, Indiana, Penn State, Connecticut, Virginia, North Carolina and Alabama.

Junior colleges continued to attract a growing number of students. The 610 junior colleges reported had a total registration of 233,785, an increase of 18.8%.

The graduate enrolment was estimated to be over 90,000. There was concern lest there develop an oversupply of Ph.D. holders. In the decade closing 1938–39, the more important U.S. universities conferred more than 25,000 Ph.D. degrees. Of this number, more than 4,000 were in chemistry alone. There was growing recognition of the fact that the best students are most likely to find satisfactory appointments.

A number of the graduate schools were exploring ways and means to improve the quality of the students they admit. In co-operation with a group of school superintendents, the American Council on Education was experimenting with an objective examination in teacher selection, to be given after the completion of the prospective teacher's prescribed course. This examination procedure was in line with the long-established policy of the professions of law and medicine, where before admission to practice examinations are prescribed. The American Council on Education was also studying the product of teacher preparation in a selected list of 20 higher educational institutions including universities and liberal arts colleges as well as teachers colleges. A group of 22 colleges was engaged in a co-operative study of the special problems of general education as formulated by the Progressive Education association. Another group of well established liberal arts colleges on the eastern seaboard was attempting to evaluate the work of the conventional four-year liberal arts course.

In these inquiries thousands of students were being tested by one or another group of examiners.

Meanwhile, professional schools, especially of law, engineering and medicine, tended to insist less and less upon certain specific subjects or courses as prerequisites to admission. (W. A. J.)

Great Britain.—In Great Britain in 1940 the primary preoccu-

pation of university administration was with the possibility of maintaining instruction and providing facilities for research work. Fortunately the University Grants committee was able to renew its annual grant of over £2,000,000, so that, in spite of a reduction of the income received from students' fees, the financial problem was not acute. Further, the fact that the age for conscription was fixed at 20 enabled many students to begin their university work and make appreciable progress before being enrolled in one of the fighting services.

Most universities assisted students by providing that if they reached a certain stage in their studies they would be permitted to count towards their period of university residence a year of approved service with the forces. The tribunals set up under the National Service (Armed Forces) act to consider cases of hardship, liberally interpreted their powers of granting postponement, with the result that many undergraduates were enabled to complete their degree courses before being called up.

Another measure which conduced to the retention of many undergraduates at universities was the establishment of joint recruiting boards, with technical committees working in co-operation, who not only assessed the capacity for leadership among those who appeared before them, but also classed in several categories the attainments of those studying chemistry, engineering, mathematics and other scientific subjects. Medical, dental and veterinary students, who had reached a certain stage in their courses, were advised to continue their studies.

All the universities, except the majority of the colleges and schools of the University of London, continued their work at their usual headquarters. The evacuation of students from London caused some degree of hardship, but the hospitable arrangements made by receiving institutions mitigated the difficulties. That the evacuation was advisable was rendered plain by the savage destruction of University college and other centres of learning in the metropolis.

Other measures adopted by universities generally to meet wartime conditions included the conferment of powers, to ensure that the work of universities is carried on without some of the formalities of peacetime administration. Wider powers were vested in the principal officers. Degree days were abolished by many institutions. Prizes, fellowships, studentships and postgraduate scholarships were suspended in greater or less degree. Fees were refunded if a student was unable to complete his course.

Re-arrangement of timetables of lectures and laboratory work helped to mitigate the effect of the black-out restrictions. The consideration which had been given during the year 1938–39 to the possibility of war and its repercussions on university life found universities prepared. Shelters had been provided. Valuable books, documents and incunabula had been deposited in safe storage.

The establishment of a central register enabled universities to assist materially in the national effort by providing experts in scientific subjects, languages and administration for key positions in government and industry.

The numbers withdrawn from university teaching and research placed heavy burdens on those remaining; but the reduction in the number of students eased the situation. Universities were also able to house and provide facilities for a number of government departments—especially those engaged in secret scientific research work. They also accepted the responsibility for the training of officers in the technical services by the provision of short courses of instruction. Some were also able to help by allocating accommodation to officer cadet training units. Further assistance was given for the education of the fighting services by the establishment of a Central Advisory committee with regional committees at most of the university headquarters—lecture courses being given by members of university staffs. Building schemes, proposals for the extension of departments and other capital charges had, perforce, to be suspended.

The influx of refugees from the continent of Europe and the necessity for taking precautions against espionage presented fresh problems to the universities. Members of staffs of foreign nationality who had been interned were assessed as to their usefulness as teachers and in most cases were released on the representations of the Committee of Vice-Chancellors and Principals. Similar action was taken in respect of interned students. Steps were also taken to accord hospitality to professors and other teachers of conquered countries with a view to the preservation of their national culture.

(*See* also CAMBRIDGE, UNIVERSITY OF; LONDON UNIVERSITY; OXFORD UNIVERSITY.)

British Empire.—Owing to war conditions reports from universities in the empire were delayed, and, in some cases, lost. But such as were received indicated that while university life and conditions had not so far been materially changed, action along lines adopted in Great Britain was being taken. Minor privileges were granted and slight deficiencies for degrees were overlooked when a student enlisted in the Canadian active service forces. Canadian universities were further requiring the military training of all male undergraduates who were physically fit and were 18 years or over at the time of registration. In the case of those who would be 21 or over in July 1941, the required courses of training would be equivalent to the military training demanded under the National Reserves Mobilization act.

In Australia the University of Adelaide speeded up the medical course by reducing the vacation periods and by other adjustments of the lecture timetable. Medical students who qualified for the degrees of M.B., B.S. before the normal time and offered and had been accepted for active service might apply for the immediate conferment of the degrees. In the University of Melbourne special arrangements were made for the examination of students whose studies were affected by defence duties. Provision was also made for adjustments of the curriculum in students' courses, which might be resumed after military service. The University of Sydney, in conjunction with the government, made provision for teaching and research in aeronautical science.

In South Africa the University of Cape Town introduced special emergency measures whereby all final year students were required to complete their examination in 1940 or later. Other students might be granted a pass in each subject taken in respect of which favourable recommendation was made by the board of the faculty concerned. Rhodes University college, of the University of South Africa, also made provision for special examinations for students who went on active service in 1940.

In India the University of Calcutta approved the grant of equivalence for the period spent by students at British universities for the purpose of completing degree courses. This university also appointed an organizer of physical education. In other provinces varying measures of compulsory training in higher education were adopted.

Europe.—Of universities in Europe little information was available in 1940. In the conquered countries higher education, in effect, ceased and the arrangements for the exchange of postgraduate research workers, gradually being introduced under the aegis of the British council, had come to a standstill.

The following seven pages carry a selected list of universities and colleges in the U.S. and Canada, with location, year founded, chief executive, enrolment, size of faculty, endowment and number of library volumes, for the academic year 1940–41. An asterisk denotes 1939–40 data.

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
A							
Abilene Christian College, Abilene, Tex.	1906	Don H. Morris	682	932	42	$ —	14,680
*Abraham Baldwin Agri. Col., Tifton, Ga.	1933	George H. King	402	402	19	—	10,000
Adams St. Tch. Col., Alamosa, Colo.	1921	Ira Richardson	360	397	32	—	16,000
Adelphi College, Garden City, N. Y.	1896	Paul Dawson Eddy	463	565	42	43,150	33,779
Adrian College, Adrian, Mich.	1845	Samuel J. Harrison	203	305	20	150,000	10,000
Agnes Scott College, Decatur, Ga.	1889	James R. McCain	490	506	65	1,690,000	34,500
Akron, University of, Akron, Ohio	1870	H. E. Simmons	1,763	3,800	115	153,755	54,896
Alabama College, Montevallo, Ala.	1896	A. F. Harman	902	1,450	88	582,722	40,000
Alabama Polytechnic Inst., Auburn, Ala.	1872	Luther N. Duncan	3,833	—	286	—	77,000
Ala. State Teachers College, Florence, Ala.	1872	J. A. Keller	1,351	1,716	43	—	50,000
Ala. State Teachers Col., Jacksonville, Ala.	1883	Clarence W. Daugette	539	748	65	—	27,000
Ala. State Teachers Col., Livingston, Ala.	1883	N. F. Greenhill	406	—	27	—	19,881
*Ala. State Teachers Col., Montgomery, Ala.	1874	H. C. Trenholm	1,336	2,236	79	—	11,026
Alabama, University of, University, Ala.	1831	Richard C. Foster	8,017	—	497	4,899,526	235,078
Alaska, University of, College, Alaska	1915	Charles E. Bunnell	268	275	33	1,000	17,500
*Alberta, Univ. of, Edmonton, Alta., Can.	1906	W. A. R. Kerr	1,900	2,754	227	699,671	69,892
Albertus Magnus Col., New Haven, Conn.	1925	Sister M. Isabel	176	379	39	—	15,000
Albion College, Albion, Mich.	1835	John L. Seaton	806	817	55	1,023,045	55,100
Albion State Normal School, Albion, Ida.	1893	Raymond H. Snyder	424	—	25	419,000	13,000
Albright College, Reading, Pa.	1856	Harry V. Masters	382	509	30	890,892	20,000
Alcorn Agri. & Mech. Col., Alcorn, Miss.	1871	William H. Bell	550	550	64	209,871	10,000
Alderson-Broaddus Col., Philippi, W. Va.	1871	John W. Elliott	150	321	18	45,000	6,400
Alfred University, Alfred, N. Y.	1836	J. Nelson Norwood	587	858	67	1,094,160	59,000
Allegheny College, Meadville, Pa.	1815	William P. Tolley	717	974	50	1,501,487	130,000
Allen University, Columbia, S. C.	1870	Samuel R. Higgins	359	361	20	35,000	16,102
*Alma College, Alma, Mich.	1886	John W. Dunning	405	405	40	700,000	50,000
Alma College, St. Thomas, Ont., Can.	1877	P. S. Dobson	150	300	25	12,000	2,000
Alma White College, Zarephath, N. J.	1921	Arthur K. White	20	30	21	—	7,000
American Inter. Col., Springfield, Mass.	1885	Chester S. McGown	617	847	33	—	10,000
American University, Los Angeles, Calif.	1921	Frederick H. Clapp	128	205	12	—	3,800
American University, Washington, D. C.	1893	Edward W. Engel	320	1,494	88	942,143	47,965
Amherst College, Amherst, Mass.	1821	Stanley King	850	850	81	12,289,989	226,475
Anderson College, Anderson, S. C.	1911	Annie D. Denmark	203	339	30	—	6,763
Andrew College, Cuthbert, Ga.	1854	S. C. Olliff	100	118	14	50,000	4,000
Antioch College, Yellow Springs, Ohio	1853	A. D. Henderson	711	712	100	328,705	56,836
Appalachian St. Teachers Col., Boone, N.C.	1903	B. B. Dougherty	950	2,000	75	—	22,390
Arizona, University of, Tucson, Ariz.	1885	Alfred Atkinson	2,581	3,222	199	—	138,804
Ark. Agri. Mech. & Norm. Col., Pine Bluff.	1873	John Brown Watson	390	780	59	—	4,448
Arkansas Baptist College, Little Rock, Ark.	1884	T. W. Coggs	144	147	15	—	1,272
Arkansas College, Batesville, Ark.	1872	T. M. Lowry, Jr.	182	275	15	70,124	13,000
Arkansas Polytechnic Col., Russellville, Ark.	1909	J. W. Hull	675	768	30	—	13,065
Arkansas State College, Jonesboro, Ark.	1909	V. C. Kays	2,000	—	40	—	14,029
Aroostook St. Norm. Sch., Presque Isle, Me.	1903	Clifford O. T. Wieden	150	198	18	—	4,200
Asheville College, Asheville, N. C.	1887	Frank C. Foster	339	375	27	—	16,500
Ashland College, Ashland, Ohio	1878	Edward G. Mason	301	725	41	419,576	18,000
Athens College, Athens, Ala.	1843	E. R. Naylor	537	554	31	250,000	14,800
*Atlanta University, Atlanta, Ga.	1865	Rufus E. Clement	97	972	36	3,485,508	66,000
Atlantic Christian College, Wilson, N. C.	1902	Howard S. Hilley	406	703	25	348,222	13,263
Atlantic Union Col., So. Lancaster, Mass.	1882	G. Eric Jones	450	600	30	—	15,300
Augsburg Col. & Sem., Minneapolis, Minn.	1869	Bernhard Christensen	443	452	33	73,951	18,500
Augustana College & Theological Seminary, Rock Island, Ill.	1860	Conrad Bergendoff	620	843	51	1,500,000	70,000
Aurora College, Aurora, Ill.	1893	Theodore P. Stephens	182	235	24	—	27,261
Austin Peay Norm. Sch., Clarksville, Tenn.	1929	P. P. Claxton	579	624	26	—	9,000
Averett College, Danville, Va.	1859	Curtis V. Bishop	315	325	27	73,650	5,000
Avery Institute, Charleston, S. C.	1865	Frank A. DeCosta	470	—	19	—	2,000
B							
Baker University, Baldwin City, Kan.	1858	Nelson P. Horn	355	—	32	1,354,826	66,000
Baldwin-Wallace College, Berea, Ohio	1845	Louis C. Wright	693	840	53	1,782,004	34,000
Ball State Teachers College, Muncie, Ind.	1918	L. A. Pittenger	1,950	2,011	102	—	72,500
Bates College, Lewiston, Me.	1864	Clifton D. Gray	749	996	52	1,919,425	72,938
Baylor University, Waco, Tex.	1845	Pat M. Neff	2,229	2,365	121	1,637,327	94,300
Beaver College, Jenkintown, Pa.	1853	Raymon Kistler	550	600	70	—	19,500
Beckley College, Beckley, W. Va.	1933	J. L. Bumgardner	476	592	32	—	11,041
Belhaven College, Jackson, Miss.	1894	G. T. Gillespie	275	301	30	100,000	15,000
Belmont Abbey College, Belmont, N. C.	1878	Vincent G. Taylor	182	202	31	—	40,000
Beloit College, Beloit, Wis.	1846	Irving Maurer	574	—	50	2,299,588	115,000
*Benedict College, Columbia, S. C.	1870	J. J. Starks	376	397	28	140,000	25,000
Bennett College, Greensboro, N.C.	1873	David D. Jones	331	360	29	354,812	13,096
Bennington College, Bennington, Vt.	1932	Robert D. Leigh	285	—	59	123,905	19,349
Berea College, Berea, Ky.	1855	Francis S. Hutchins	852	924	67	10,392,200	88,000
Berry College and Schools, Mt. Berry, Ga.	1902	Martha Berry	1,200	1,200	150	—	15,000
Bessie Tift College, Forsyth, Ga.	1847	C. L. McGinty	182	187	21	480,000	13,006
Bethany College, Bethany, W. Va.	1840	W. H. Cramblet	373	383	34	2,221,452	30,802
Bethany College, Lindsborg, Kan.	1881	Ernst F. Pihlblad	296	417	35	$ 363,059	20,442
Bethany-Peniel College, Bethany, Okla.	1904	A. K. Bracken	380	431	20	—	12,000
Bethel College, McKenzie, Tenn.	1842	Ewell K. Reagin	236	—	14	415,000	10,500
Bethel College, North Newton, Kan.	1887	Edmund G. Kaufman	404	455	32	330,000	21,000
Bethel Woman's Col., Hopkinsville, Ky.	1854	Kenneth R. Patterson	150	169	23	11,000	8,276
Bethune-Cookman Col., Daytona Bch., Fla.	1904	Mary McL. Bethune	475	642	19	93,949	8,692
Biltmore College, Asheville, N. C.	1927	C. A. Lloyd	155	175	11	—	30,000
Birmingham-South. Col., Birmingham, Ala.	1856	Raymond R. Paty	821	1,574	58	624,534	49,500
Bishop College, Marshall, Texas	1881	Joseph J. Rhoads	568	718	31	13,846	20,509
Blackstone Col. for Girls, Blackstone, Va.	1892	J. Paul Glick	184	189	21	—	3,701
Blinn College, Brenham, Texas	1883	C. F. Schmidt	140	179	12	—	4,000
Bluefield St. Tch. Col., Bluefield, W. Va.	1895	Henry L. Dickason	327	527	22	—	7,000
Blue Mountain Col., Blue Mountain, Miss.	1873	Lawrence T. Lowrey	288	493	26	294,000	13,260
Blue Ridge College, New Windsor, Md.	1839	Homer E. Cooper	160	—	24	—	5,000
Bluffton College, Bluffton, Ohio	1899	L. L. Ramseyer	209	263	25	180,000	12,850
Bob Jones College, Cleveland, Tenn.	1926	R. R. (Bob) Jones	500	—	60	—	11,000
Boston College, Chestnut Hill, Mass.	1863	Wm. J. Murphy	3,320	3,440	205	—	171,000
Boston University, Boston, Mass.	1869	Daniel L. Marsh	7,050	13,285	676	5,218,402	209,483
Bowdoin College, Brunswick, Me.	1794	K. C. M. Sills	639	—	57	8,191,498	185,000
Bowling Green St. Univ., Bowling Green, O.	1910	Frank J. Prout	1,529	2,530	104	—	55,400
Bradley Polytechnic Inst., Peoria, Ill.	1896	Frederic R. Hamilton	943	2,107	70	2,311,753	49,818
Brandon College, Brandon, Man., Canada	1899	John R. C. Evans	148	—	13	500,000	10,000
Brenau College, Gainesville, Ga.	1878	H. J. Pearce, Sr.	390	475	40	500,000	16,000
Brevard College, Brevard, N. C.	1934	E. J. Coltrane	383	423	33	62,000	7,279
Bridgeport City Norm. Sch., Bridge., Conn.	1879	Minnie C. Kelsey	35	35	12	—	3,900
Bridgewater College, Bridgewater, Va.	1880	Paul H. Bowman	280	297	28	511,818	15,000
Brigham Young University, Provo, Utah.	1875	Franklin S. Harris	2,800	3,400	150	287,401	110,000
British Columbia, Univ. of, Vancouver, B. C.	1915	Leonard S. Klinck	2,534	3,121	100	100,000	120,000
Brooklyn Polytechnic Inst., Brooklyn, N.Y.	1854	Harry S. Rogers	687	3,804	210	1,691,759	22,760
Brown University, Providence, R. I.	1764	Henry M. Wriston	2,214	2,224	191	11,516,000	553,000
Bryn Mawr College, Bryn Mawr, Pa.	1885	Marion E. Park	581	654	100	6,700,000	166,500
Bucknell University, Lewisburg, Pa.	1846	Arnaud C. Marts	1,269	1,904	85	1,300,000	100,000
Buena Vista College, Storm Lake, Iowa	1891	Henry Olson	315	324	23	123,000	25,000
Buffalo, University of, Buffalo, N. Y.	1846	Samuel P. Capen	1,662	4,659	589	5,657,695	159,503
Butler University, Indianapolis, Ind.	1850	Daniel S. Robinson	1,717	3,723	136	3,009,000	75,000
C							
California Inst. of Tech., Pasadena, Calif.	1891	R. A. Millikan	934	—	211	12,000,000	51,395
California, University of, Berkeley, Calif.	1868	Robert G. Sproul	28,851	34,355	2156	24,889,566	1,706,686
Calvin College, Grand Rapids, Mich.	1876	Henry Schultze	490	499	25	206,000	25,300
Campbell College, J. P., Jackson, Miss.	1885	S. L. Greene	165	—	17	—	650
Canisius College, Buffalo, N. Y.	1870	Francis A. O'Malley	685	1,550	63	61,000	34,150
Capital University, Columbus, Ohio	1830	Otto Mees	757	1,063	82	590,608	31,500
Carleton College, Northfield, Minn.	1866	Donald J. Cowling	834	847	71	3,890,629	128,327
Carnegie Inst. of Tech., Pittsburgh, Pa.	1900	Robert E. Doherty	2,370	5,730	424	17,877,402	30,000
Carroll College, Helena, Mont.	1909	E. J. Riley	153	228	19	500,000	13,000
Carroll College, Waukesha, Wis.	1846	G. T. Vander Lugt	514	564	37	840,107	21,600
Carson-Newman Col., Jefferson City, Tenn.	1851	James T. Warren	442	460	28	539,000	21,000
Case School of Apld. Sc. Cleveland, Ohio	1881	Wm. E. Wickenden	943	1,205	135	4,250,000	38,000
Catawba College, Salisbury, N. C.	1851	Howard R. Omwake	490	710	36	387,410	17,350
Catholic Col. of Oklahoma, Guthrie, Okla.	1916	Mother M. A. Arvin	73	—	18	—	8,000
*Catholic Sisters Col., The, Washington, D.C.	1912	Edw. B. Jordan	97	117	37	—	14,165
Catholic Univ. of Amer., Washington, D. C.	1887	Joseph M. Corrigan	1,804	2,309	279	3,223,398	300,000
Cedar Crest College, Allentown, Pa.	1868	Wm. F. Curtis	315	317	33	87,001	22,000
Cedarville College, Cedarville, Ohio	1894	Walter Smith Kilpatrick	85	100	12	200,000	8,000
Centenary College of La., Shreveport, La.	1825	Pierce Cline	670	911	44	513,730	23,000
Central College, McPherson, Kan.	1914	Orville S. Walters	101	111	23	19,864	7,324
Central College, Fayette, Mo.	1855	Robert H. Ruff	544	733	42	1,298,644	59,000
Central College, Pella, Iowa	1853	Irwin J. Lubbers	374	381	30	254,754	15,000
Central Mo. St. Tch. Col., Warrensburg, Mo.	1870	George W. Diemer	1,470	—	93	—	60,000
Central Normal College, Danville, Ind.	1876	Virgil Hunt	400	—	22	4,000	10,498
Central State College, Edmond, Okla.	1890	R. R. Robinson	1,000	—	65	—	36,309
Central St. Tch. Col., Mt. Pleasant, Mich.	1892	C. L. Anspach	1,300	1,600	100	—	40,000
Central St. Teachers Col., Stevens Point, Wisconsin	1894	William C. Hansen	770	1,066	52	—	34,458
Cent. Wash. Col. of Edu. Ellensburg, Wash.	1891	Robert E. McConnell	891	1,212	55	—	31,548
Central Wesleyan Col., Warrenton, Mo.	1864	C. A. Greene	52	121	10	—	17,047
Centre College, Danville, Ky.	1819	Robt. L. McLeod, Jr.	350	400	30	1,700,000	32,000
Chapman College, Los Angeles, Calif.	1920	Cecil F. Cheverton	192	248	22	124,000	11,000
Charleston, College of, Charleston, S. C.	1770	Harrison Randolph	417	558	21	449,000	29,668
*Chattanooga, Univ. of, Chattanooga, Tenn.	1886	Archie M. Palmer	631	1,049	52	787,098	35,000
Cherokee Ind. Norm. Sch., Pembroke, N.C.	1887	Owens Hand Browne	130	150	12	—	2,804
Chestnut Hill, Col. of, Philadelphia, Pa.	1871	Mother Mary James	301	590	46	—	25,000
Cheyney St. Tchrs. Col., Cheyney, Pa.	1837	Leslie Pinckney Hill	206	—	17	—	12,000
Chicago, University of, Chicago, Ill.	1891	Robert M. Hutchins	11,674	14,088	873	72,569,187	1,300,785
Chico State College, Chico, Calif.	1889	Aymer Jay Hamilton	816	—	52	—	25,946

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
Christian College, Columbia, Mo.	1851	James C. Miller	324	—	40	$ 90,000	9,658
Cincinnati, University of, Cincinnati, Ohio	1870	Raymond Walters	4,346	11,778	931	0,926,378	491,537
Citadel, The, Charleston, S. C.	1842	C. P. Summerall	1,340	—	77	—	25,000
Claflin College, Orangeburg, S. C.	1869	Joseph B. Randolph	272	—	22	162,000	11,365
Claremont Colleges, Claremont, Calif.	1925	Russell M. Story	219	—	93	861,262	33,828
Clark University, Worcester, Mass.	1887	Wallace W. Atwood	343	577	40	5,000,000	163,000
Clarke College, Dubuque, Iowa	1843	Sister M. A. Durkin	316	509	45	—	19,000
Clarkson College of Tech., Potsdam, N. Y.	1896	John A. Ross, Jr.	609	—	40	1,446,189	10,461
Cleary College, Ypsilanti, Mich.	1883	P. Roger Cleary	527	—	24	—	7,000
Clemson Agri. Col., Clemson, S. C.	1889	Robert Franklin Poole	2,315	2,812	157	68,539	53,265
Clinton Norm.& Indus.Col.,Rock Hill,S.C.	1894	E. W. Brice	180	240	9	—	10,000
Coe College, Cedar Rapids, Iowa	1881	Harry M. Gage	770	1,008	66	1,676,505	48,611
Coker College, Hartsville, S. C.	1894	C. Sylvester Green	251	283	29	750,000	17,890
Colby College, Waterville, Me.	1820	Franklin W. Johnson	700	—	53	2,827,152	100,000
Colgate University, Hamilton, N. Y.	1819	George B. Cutten	1,065	—	107	5,670,000	120,000
Colorado College, Colorado Springs, Colo.	1874	Thurston J. Davies	766	1,022	75	2,577,000	118,000
Colorado School of Mines, Golden, Colo.	1874	M. F. Coolbaugh	786	1,033	70	—	50,000
Colorado State College of Agriculture and Mechanic Arts, Fort Collins, Colo.	1874	Roy M. Green	2,048	3,310	301	—	96,482
Colorado St. Col. of Edu., Greeley, Colo.	1890	George W. Frasier	1,665	4,586	105	—	98,464
Colorado, University of, Boulder, Colo.	1877	Robert L. Stearns	4,141	7,995	300	—	307,387
Colorado Woman's College, Denver, Colo.	1888	J. E. Huchingson	353	—	33	97,592	6,140
Colored Agri. & Norm.Uni.,Langston, Okla.	1897	G. L. Harrison	821	938	65	—	8,000
*Columbia College, Columbia, S. C.	1854	J. Caldwell Guilds	305	345	26	467,000	15,000
Columbia University, New York, N. Y.	1754	Nicholas M. Butler	—	31,411	3317	87,995,257	1,710,062
Concord State Tch. Col., Athens, W. Va.	1875	J. Frank Marsh	583	1,283	34	—	18,650
Concordia College, Moorhead, Minn.	1891	J. N. Brown	523	—	45	587,066	26,200
Concordia Theol. Seminary, St. Louis, Mo.	1839	L. E. Fuerbringer	410	420	17	75,008	30,000
Concordia Teachers Col., River Forest, Ill.	1864	Arthur W. Klinck	398	538	25	100,000	21,000
Concordia Teachers Col., Seward, Neb.	1894	Charles F. Brommer	168	245	13	—	7,980
Connecticut, University of, Storrs, Conn.	1881	Albert N. Jorgensen	1,413	1,644	190	306,061	70,000
Connecticut College, New London, Conn.	1911	Katharine Blunt	758	780	87	1,364,896	90,000
Conn. Teachers Col., New Britain, Conn.	1849	Herbert D. Welte	479	—	35	—	18,000
Converse College, Spartanburg, S. C.	1890	Edw. M. Gwathmey	380	409	51	640,000	29,500
Cooper Union, New York, N. Y.	1859	Gano Dunn	2,432	—	146	6,977,866	78,594
Cornell College, Mount Vernon, Iowa	1853	John B. Magee	632	708	50	2,313,209	60,000
Cornell University, Ithaca, N. Y.	1865	Edmund Ezra Day	7,063	9,084	1689	31,015,017	1,071,844
Cortland State Normal Sch., Cortland,N.Y.	1867	H. DeW. DeGroat	476	—	54	—	16,000
Creighton University, Omaha, Neb.	1878	Jos. P. Zuercher	1,480	2,023	263	4,000,000	112,549
Culver-Stockton Col., Canton, Mo.	1853	W. H. McDonald	360	—	23	1,019,993	26,000
Cumberland University, Lebanon, Tenn.	1842	Ernest L. Stockton	350	500	25	150,000	15,000
D							
Dakota Wesleyan Univ., Mitchell, S. D.	1885	Joseph H. Edge	304	401	35	595,723	27,500
Dalhousie Univ., Halifax, N. S., Canada	1818	Carleton Stanley	764	809	167	2,662,105	57,960
Dana Col.(Trinity Theol.Sem.),Blair, Neb.	1884	L. Siersbeck	144	160	17	180,000	7,500
Danbury State Tch. Col., Danbury, Conn.	1904	Ralph C. Jenkins	214	—	46	—	20,000
Daniel Baker College, Brownwood, Texas	1889	Thomas H. Hart	318	631	22	250,000	9,000
Dartmouth College, Hanover, N. H.	1769	Ernest M. Hopkins	2,431	2,441	277	17,962,995	515,112
Davidson College, Davidson, N. C.	1837	Walter Lee Lingle	682	807	46	1,031,310	42,000
Davis & Elkins College, Elkins, W. Va.	1904	R. T. L. Liston	206	411	16	135,000	17,000
Dayton, University of, Dayton, Ohio	1850	John A. Elbert	685	1,648	91	—	35,547
Defiance College, Defiance, Ohio	1885	John Wilbert Claxton	390	—	32	350,000	25,000
Delaware, University of, Newark, Del.	1833	Walter Hullihen	903	1,316	108	686,304	72,901
Delta State Tch. Col., Cleveland, Miss.	1924	William M. Kethley	499	550	31	—	16,000
Denison University, Granville, Ohio	1831	Kenneth I. Brown	845	857	74	3,413,341	93,625
Denver, Univ. of, Denver, Colo.	1864	David Shaw Duncan	1,892	3,256	277	2,661,753	129,448
DePaul University, Chicago, Ill.	1898	M. J. O'Connell	2,226	8,097	237	1,925,000	69,271
DePauw University, Greencastle, Ind.	1837	Clyde E. Wildman	1,509	1,525	101	6,105,830	93,916
De Sales College, Toledo, Ohio	1936	Francis J. Macelwane	355	1,289	52	8,000	25,696
*Detroit Inst. of Tech., Detroit, Mich.	1891	T. Paul Hickey	1,303	1,853	120	—	22,000
Detroit, University of, Detroit, Mich.	1877	Charles H. Cloud	2,424	4,059	204	1,648,000	105,450
Dickinson College, Carlisle, Pa.	1783	Fred P. Corson	548	—	37	1,401,723	64,464
Dillard University, New Orleans, La.	1930	Rudolph Moses	249	353	29	—	21,700
Doane College, Crete, Neb.	1872	Bryan S. Stoffer	302	306	29	901,123	29,055
Drake University, Des Moines, Iowa	1881	D. W. Morehouse	1,329	2,480	110	1,626,000	80,000
Drew University, Madison, N. J.	1867	O. Gerald Lawson	355	418	43	—	182,026
Drexel Inst. of Tech., Philadelphia, Pa.	1891	Parke R. Kolbe	1,841	1,916	136	3,314,718	68,919
Dropsie College, Philadelphia, Pa.	1905	Horace Stern	40	—	6	800,000	46,104
Drury College, Springfield, Mo.	1873	J. F. Findlay	387	—	34	1,055,881	54,000
Dubuque, University of, Dubuque, Iowa	1852	Dale D. Welch	474	710	41	736,876	23,755
Duchesne College, Omaha, Neb.	1881	Mother Helen Casey	138	144	20	22,000	14,500
Duke University, Durham, N. C.	1838	Robert Lee Flowers	3,673	5,679	446	34,936,169	600,235
Duluth State Tch. Col., Duluth, Minn.	1902	Mary L. Ober	740	1,274	46	—	22,095
Duquesne University, Pittsburgh, Pa.	1878	Raymond V. Kirk	1,178	4,194	190	—	52,000
*D'Youville College, Buffalo, N. Y.	1908	Sister Grace	325	325	32	—	23,000
E							
Earlham College, Richmond, Ind.	1847	Wm. C. Dennis	475	500	47	$ 1,328,950	65,000
East Carolina Tch. Col.,Greenville, N. C.	1907	Leon R. Meadows	1,754	1,826	82	—	28,000
East Central State College, Ada, Okla.	1909	A. Linscheid	1,380	2,505	75	—	24,860
Eastern Ill. St. Tch. Col., Charleston, Ill.	1899	Robert G. Buzzard	1,152	1,937	98	—	53,127
Eastern Ky. St. Tch. Col., Richmond, Ky.	1906	Herman L. Donovan	1,150	2,104	84	—	57,000
Eastern Mont. St. Norm.Sch.,Billings,Mont.	1925	L. B. McMullen	277	649	18	—	11,300
Eastern Nazarene Col., Wollaston, Mass.	1918	G. B. Williamson	218	—	20	—	10,000
Eastern Oregon College of Education, La Grande, Ore.	1929	Roben J. Maaske	344	348	24	—	20,000
Eastern State Norm. Sch., Castine, Me.	1863	William D. Hall	51	65	8	—	6,400
*Eastern Wash. Col. of Ed., Cheney, Wash.	1890	Ralph E. Tieje	1,378	1,378	57	—	45,742
Edmonton Jesuit Col.,Edmonton,Alta.,Can.	1913	A. Genest	110	—	15	—	20,000
Elizabethtown Col., Elizabethtown, Pa.	1900	Ralph W. Schlosser	145	358	21	180,508	12,175
Elmhurst College, Elmhurst, Ill.	1871	Timothy Lehmann	352	386	36	214,520	34,999
Elmira College, Elmira, N. Y.	1855	William S. A. Pott	308	317	50	859,150	49,706
Elon College, Elon College, N. C.	1889	Leon E. Smith	600	715	33	512,000	30,000
Emerson College, Boston, Mass.	1880	Harry Seymour Ross	214	423	26	—	9,588
Emmanuel College, Boston, Mass.	1919	Sister Teresa Patricia	526	1,030	56	—	21,679
Emmanuel Col., Saskatoon, Sask., Canada	1879	Rev. Wm. A. Ferguson	32	—	4	25,000	6,000
Emmanuel Miss.Col., Berrien Spgs., Mich.	1901	Henry J. Klooster	327	554	31	—	24,920
Emory and Henry College, Emory, Va.	1836	James N. Hillman	280	—	18	315,000	22,000
Emory University, Emory, Ga.	1836	Harvey W. Cox	1,323	1,970	115	4,340,950	179,251
Emporia, College of, Emporia, Kan.	1882	Leslie G. Whitcomb	274	293	27	—	23,500
Erskine College, Due West, S. C.	1839	Robert C. Grier	237	247	25	356,000	22,000
Evangelical Theological Seminary, Naperville, Ill.	1873	H. R. Heininger	85	90	7	450,000	9,000
Evansville College, Evansville, Ind.	1854	Lincoln B. Hale	550	1,500	35	400,000	18,000
F							
*Fairmont St. Tch. Col., Fairmont, W. Va.	1867	Joseph Rosier	605	848	45	—	23,993
*Fannie A. Smith T. T. Sch., Bridgeport, Conn.	1885	Fannie A. Smith	20	20	8	—	2,100
*Fayetteville State Tch. Col., Fayetteville, N. C.	1877	J. W. Seabrook	614	614	22	—	12,892
Fenn College, Cleveland, Ohio	1881	Cecil V. Thomas	831	3,162	151	789,060	14,692
Ferris Institute, Big Rapids, Mich.	1884	Merle S. Ward	500	803	30	22,000	8,500
Findlay College, Findlay, Ohio	1882	H. R. Dunathan	312	331	23	443,580	20,000
Fisk University, Nashville, Tenn.	1865	Thomas E. Jones	435	629	44	2,812,593	68,373
Fletcher Col., John, Univ. Pk., Ia.	1906	Charles W. Butler	140	—	16	19,050	15,323
Fla. Agri. & Mech. Col., Tallahassee, Fla.	1887	J. R. E. Lee	1,094	1,013	126	—	18,000
Florida Southern College, Lakeland, Fla.	1885	Ludd M. Spivey	755	1,216	72	526,000	24,500
Fla. State Col. for Women, Tallahassee, Fla.	1905	Edward Conradi	1,927	3,158	175	205,701	83,441
Florida, University of, Gainesville, Fla.	1853	John J. Tigert	3,299	—	196	286,250	155,211
Fordham University, New York, N. Y.	1841	Robert I. Gannon	7,500	8,500	500	—	225,000
Fort Hays Kansas State College, Hays, Kansas	1902	Clarence E. Rarick	1,085	—	70	—	64,000
Franklin & Marshall Col., Lancaster, Pa.	1787	John A. Schaeffer	956	—	48	1,263,706	80,000
Franklin College of Ind., Franklin, Ind.	1834	William G. Spencer	342	344	32	825,000	33,000
Franklin University, Columbus, Ohio	1902	Raymond A. Witchey	239	1,608	55	—	9,550
Fresno State College, Fresno, Calif.	1911	Frank W. Thomas	2,101	2,230	140	—	46,800
Friends University, Wichita, Kan.	1898	W. A. Young	386	497	33	566,640	20,000
Furman University, Greenville, S. C.	1826	John Laney Plyler	962	1,360	63	801,318	40,000
G							
Gallaudet College, Washington, D. C.	1864	Percival Hall	150	—	20	—	10,000
Geneva College, Beaver Falls, Pa.	1848	M. M. Pearce	492	723	36	735,000	30,000
Geo. Peabody Col. for Tch., Nashville, Tenn.	1875	Sidney C. Garrison	1,282	2,824	121	5,301,000	130,000
Georgetown College, Georgetown, Ky.	1829	Henry N. Sherwood	314	599	28	583,470	12,400
Georgetown Univ., Washington, D. C.	1789	Arthur A. O'Leary	2,505	—	670	—	200,000
Geo. Washington Univ., The, Washington, D. C.	1821	Cloyd H. Marvin	2,023	8,720	421	2,355,137	125,000
George Williams College, Chicago, Ill.	1890	Harold Coe Coffman	219	320	33	1,446,688	16,500
George Williams Col., Sir, Montreal, Can.	1873	K. E. Norris	576	2,408	83	—	11,000
Georgia Sch. of Technology, Atlanta, Ga.	1885	Marion L. Brittain	2,761	—	179	465,000	47,199
Georgia State Col., Industrial College, Ga.	1891	Benjamin F. Hubert	562	1,130	40	—	7,546
Ga. State Col. for Women, Milledgeville, Ga.	1889	Guy H. Wells	1,339	2,796	101	—	35,938
Ga. State Womans Col., Valdosta, Ga.	1913	Frank R. Reade	554	557	39	—	20,000
Georgia, University of, Athens, Ga.	1785	Harmon W. Caldwell	3,688	6,594	430	23,220	146,772
Gettysburg College, Gettysburg, Pa.	1832	Henry W. A. Hanson	600	—	45	850,000	60,000
Glenville St. Tch. Col., Glenville, W. Va.	1872	Edward G. Rohrbough	343	410	25	—	16,503
Gonzaga University, Spokane, Wash.	1887	Leo J. Robinson	825	1,123	68	—	97,000
Gorham Normal School, Gorham, Me.	1878	Francis L. Bailey	330	—	32	—	12,000
Goshen College, Goshen, Ind.	1903	Ernest Edgar Miller	252	412	37	122,457	18,600
Goucher College, Baltimore, Md.	1885	David A. Robertson	572	583	69	2,461,238	74,185
Graceland College, Lamoni, Iowa	1895	G. N. Briggs	305	—	30	233,000	18,000
Great Falls, Col. of, Great Falls, Mont.	1932	Sister Lucia	350	450	39	—	10,500

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
Greensboro College, Greensboro, N. C.	1838	Luther L. Gobbel	383	452	42	$ 467,054	20,383
Greenville College, Greenville, Ill.	1892	H. J. Long	228	317	25	123,677	11,677
Grinnell College, Grinnell, Iowa	1846	Samuel N. Stevens	745	749	75	2,250,500	100,000
Grove City College, Grove City, Pa.	1876	Weir C. Ketler	922	997	53	795,098	38,500
Guilford College, Guilford College, N. C.	1837	Clyde A. Milner	373	389	36	649,413	21,702
Gustavus Adolphus Col., St. Peter, Minn.	1862	O. J. Johnson	566	571	36	565,037	28,759
H							
Hamilton College, Clinton, N. Y.	1812	W. H. Cowley	431	—	45	4,340,832	187,446
Hamline University, St. Paul, Minn.	1854	Charles Nelson Pace	630	—	45	2,296,501	41,000
Hampden-Sydney Col., Hamp.-Sydney, Va.	1775	E. G. Gammon	396	—	22	375,113	37,500
Hampton Institute, Hampton, Va.	1868	Malcolm S. MacLean	926	1,401	102	10,002,753	60,000
Hannibal-LaGrange Col., Hannibal, Mo.	1858	W. A. Kleckner	140	150	25	17,000	7,000
Hanover College, Hanover, Ind.	1827	Albert G. Parker, Jr.	381	384	31	—	17,000
Hardin-Simmons Univ., Abilene, Tex.	1891	W. R. White	1,068	—	41	1,250,000	27,087
Harding College, Searcy, Ark.	1924	George S. Benson	310	435	29	30,000	18,000
Harris Teachers College, St. Louis, Mo.	1905	William N. Sellman	781	—	35	—	20,000
Hartwick College, Oneonta, N. Y.	1928	H. J. Arnold	310	444	29	—	12,000
Harvard University, Cambridge, Mass.	1636	James B. Conant	8,151	11,028	2069	144,355,760	4,159,606
Hastings College, Hastings, Neb.	1882	John W. Creighton	556	748	42	811,000	28,000
Haverford College, Haverford, Pa.	1833	Felix Morley	335	—	53	4,375,000	140,000
Hawaii, University of, Honolulu, Hawaii	1907	David L. Crawford	1,972	3,655	200	—	131,586
*Hebrew Union College, Cincinnati, Ohio	1875	Julian Morgenstern	63	68	17	2,400,000	90,000
Heidelberg College, Tiffin, Ohio	1850	Clarence E. Josephson	411	449	34	972,811	32,000
Henderson St. Tch. Col., Arkadelphia, Ark.	1929	Joseph Alfred Day	604	1,115	41	—	18,910
Hendrix College, Conway, Ark.	1885	John Hugh Reynolds	390	399	45	1,034,259	41,000
Hesston Col. & Bible Sch., Hesston, Kan.	1908	Milo F. Kauffman	173	203	12	35,000	4,250
High Point College, High Point, N. C.	1924	Gideon I. Humphreys	446	602	30	—	13,349
Hillman College, Clinton, Miss.	1853	M. P. Lowrey Berry	80	100	13	—	4,100
Hillsdale College, Hillsdale, Mich.	1844	Willfred O. Mauck	369	391	40	800,669	27,000
Hiram College, Hiram, Ohio	1850	Paul H. Fall	313	315	26	1,100,000	37,000
Hiwassee College, Madisonville, Tenn.	1849	Thomas A. Frick	225	285	16	66,306	4,941
Hobart College, Geneva, New York	1822	William Alfred Eddy	377	382	54	1,344,525	108,000
Hollins College, Hollins College, Va.	1842	Bessie C. Randolph	330	338	40	446,194	32,200
Holy Cross, Col. of the, Worcester, Mass.	1843	Joseph R. N. Maxwell	1,198	—	88	—	121,000
Holy Names, Col. of the, Oakland, Calif.	1880	Sister Mary Aloyse	329	642	36	—	23,438
Holy Names College, Spokane, Wash.	1912	Sister Esther Mary	158	340	28	—	13,500
Hood College, Frederick, Md.	1893	Henry I. Stahr	435	—	74	400,000	20,150
Hope College, Holland, Mich.	1866	W. Wichers	540	—	35	802,879	32,674
Houghton College, Houghton, N. Y.	1883	Stephen W. Paine	475	488	39	253,594	15,000
*Houston Col. for Negroes, Houston, Tex.	1927	E. E. Oberholtzer	435	435	24	—	5,500
Houston, University of, Houston, Texas	1934	Edison E. Oberholtzer	2,466	3,919	56	—	15,000
Howard College, Birmingham, Ala.	1842	Harwell G. Davis	649	1,070	54	750,000	33,000
Howard Payne College, Brownwood, Tex.	1889	Thomas H. Taylor	1,157	—	28	500,000	22,534
Howard University, The, Washington, D.C.	1867	M. W. Johnson	1,436	2,250	259	980,913	120,751
Hunter College, New York, N. Y.	1870	George N. Shuster	7,000	11,000	657	—	120,000
Huntingdon College, Montgomery, Ala.	1854	Hubert Searcy	400	600	30	400,000	17,500
Huntington College, Huntington, Ind.	1850	W. E. Musgrave	88	120	16	125,000	13,352
Huron College, Huron, S. D.	1883		162	235	23	824,571	22,160
I							
Idaho, The College of, Caldwell, Ida.	1891	William W. Hall, Jr.	450	—	30	530,000	19,000
Ida., So. Brnch. of the Univ. of, P'c'tello, Ida.	1927	John R. Nichols	1,007	1,049	88	—	20,000
Idaho, University of, Moscow, Ida.	1889	Harrison C. Dale	2,800	—	300	3,000,000	100,000
Illinois College, Jacksonville, Ill.	1829	H. Gary Hudson	389	394	26	1,132,833	35,500
Illinois Institute of Technology, Chicago, Ill. (formerly Armour Institute [1892] and Lewis Institute [1896])	1940	H. T. Heald	1,750	6,240	217	1,500,000	92,200
Illinois State Normal Univ., Normal, Ill.	1857	R. W. Fairchild	1,816	1,819	206	—	62,943
Illinois, University of, Urbana, Ill.	1867	Arthur C. Willard	17,212	—	1685	1,365,107	1,217,675
Ill. Wesleyan Univ., Bloomington, Ill.	1850	William E. Shaw	678	896	54	1,332,000	42,000
ImmaculateConc.Sem.Huntington,L.I.N.Y.	1926	Patrick J. Barry	185	—	19	—	25,000
Immaculate Heart Col., Los Angeles, Calif.	1906	Sister M. Eucharia	508	—	40	52,000	18,000
Incarnate Word Col., San Antonio, Tex.	1900	Sister M. Columkille	406	865	48	330,000	31,000
Indiana Central Col., Indianapolis, Ind.	1902	I. J. Good	460	468	25	74,000	12,447
Indiana State Tch. Col., Indiana, Pa.	1875	LeRoy A. King	1,425	2,267	118	—	16,000
Ind. State Tch. Col., Terre Haute, Ind.	1870	Ralph Noble Tirey	1,600	—	110	—	139,700
Indiana University, Bloomington, Ind.	1820	Herman B. Wells	8,168	—	468	2,454,000	422,139
Int.Y.M.C.A.Col., Springfield, Mass.	1885	Ernest M. Best	628	973	59	1,089,903	26,402
Iowa State College, Ames, Iowa	1858	Charles E. Friley	6,567	8,500	480	1,047,000	297,507
Iowa State Tch. Col., Cedar Falls, Iowa	1876	Malcolm Price	3,415	3,491	163	—	135,404
Iowa, State University of, Iowa City, Ia.	1847	Virgil Hancher	6,865	—	621	1,051,894	550,400
Iowa Wesleyan Col., Mt. Pleasant, Ia.	1842	Stanley B. Niles	247	329	28	400,000	27,500
Ithaca College, Ithaca, N. Y.	1892	Leonard B. Job	629	790	56	—	4,859
J							
Jacksonville College, Jacksonville, Tex.	1899	John W. Overall	70	106	8	$ 24,528	5,855
James Millikin University, Decatur, Ill.	1901	John C. Hessler	662	708	46	1,012,208	33,000
JamesOrmondWilsonTch.Col., Wash., D.C.	1873	Edgar C. Higbie	473	490	46	—	21,240
Jamestown College, Jamestown, N. D.	1883	B. H. Kroeze	432	—	30	1,072,006	15,000
John B. Stetson University, De Land, Fla.	1883	William S. Allen	661	979	78	1,000,000	38,000
John Brown Univ., Siloam Springs, Ark.	1919	John E. Brown	554	569	50	—	15,000
John Carroll University, Cleveland, Ohio	1886	Edmund C. Horne	639	962	64	2,500,000	40,000
Johns Hopkins Univ., Baltimore, Md.	1876	Isaiah Bowman	1,585	5,388	673	30,437,909	568,064
*Johnson C. Smith Univ., Charlotte, N. C.	1867	Henry L. McCrorey	330	381	26	1,750,000	22,000
Judson College, Marion, Ala.	1838	L. G. Cleverdon	105	199	30	526,000	15,813
Juniata College, Huntingdon, Pa.	1876	Charles C. Ellis	395	515	44	633,619	50,000
K							
Kalamazoo College, Kalamazoo, Mich.	1833	Paul L. Thompson	416	—	32	1,334,520	31,700
Kan. St. Tch. Col., Emporia, Kan.	1863	Thomas W. Butcher	1,565	—	125	250,000	79,751
Kan. State Col. of Agri., Manhattan, Kan.	1863	Francis D. Farrell	4,825	5,000	350	505,509	126,000
Kan. State Teachers Col., Pittsburg, Kan.	1903	Wm. A. Brandenburg	4,500	—	125	—	46,787
Kansas, University of, Lawrence, Kan.	1864	Deane W. Malott	4,867	5,485	260	260,000	320,000
Kansas Wesleyan University, Salina, Kan.	1885	Edgar K. Morrow	337	349	29	368,779	20,000
Keene Teachers College, Keene, N. H.	1909	L. P. Young	380	630	51	—	17,000
Kent State University, Kent, Ohio	1910	K. C. Leebrick	2,600	4,981	123	—	66,400
*Ky. State Col. for Negroes, Frankfort, Ky.	1886	Rufus B. Atwood	560	1,232	46	—	12,000
Kentucky, Univ. of, Lexington, Ky.	1865	Thomas P. Cooper	3,309	5,885	322	184,075	260,000
Kentucky Wesleyan Col., Winchester, Ky.	1866	Paul Shell Powell	171	240	26	62,409	16,063
Kenyon College, Gambier, Ohio	1824	Gordon K. Chalmers	309	311	42	1,748,060	60,000
Keuka College, Keuka Park, N. Y.	1890	Joseph Hillis Miller	220	222	30	300,000	18,000
King College, Bristol, Tenn.	1867	Thomas P. Johnston	256	289	16	140,000	12,500
Knox College, Galesburg, Ill.	1837	Carter Davidson	608	617	56	2,622,739	60,000
Knox College, Toronto, Ont., Canada	1844	Rev. Thomas Eakin	36	—	4	262,000	37,000
Knoxville College, Knoxville, Tenn.	1875	John A. Cotton	277	361	19	630,000	11,768
Kutztown State Tch. Col., Kutztown, Pa.	1866	Q. A. W. Rohrbach	500	800	37	—	15,250
L							
La Crosse State College, La Crosse, Wis.	1909	Rexford S. Mitchell	848	1,202	58	—	23,732
Lafayette College, Easton, Pa.	1826	William M. Lewis	930	—	98	3,965,184	104,797
LaGrange College, LaGrange, Ga.	1831	Hubert T. Quillian	166	240	19	350,000	12,000
Lake Erie College, Painesville, Ohio	1856	Vivian B. Small	190	200	35	813,539	28,500
Lake Forest College, Lake Forest, Ill.	1857	Herbert M. Moore	340	345	28	1,346,000	50,800
Lamar College, Beaumont, Tex.	1922	C. W. Bingman	500	540	20	—	4,000
Lambuth College, Jackson, Tenn.	1924	R. E. Womack	185	—	18	—	6,000
Lander College, Greenwood, S. C.	1872	John W. Speake	366	427	35	350,464	16,000
Lane College, Jackson, Tenn.	1882	James F. Lane	522	712	22	—	8,750
Laval University, Quebec, Canada	1852	Camille Roy	3,300	3,600	300	3,250,000	528,500
LaVerne College, LaVerne, Calif.	1891	C. Ernest Davis	186	206	21	55,318	11,000
Lawrence College, Appleton, Wis.	1847	Thomas N. Barrows	650	668	66	1,538,000	63,061
Lebanon Valley College, Annville, Pa.	1866	Clyde A. Lynch	457	561	38	—	22,786
Lehigh University, Bethlehem, Pa.	1865		1,772	1,892	197	7,071,294	248,000
Leland College, Baker, La.	1870	John A. Bacoats	300	500	18	120,000	6,000
LeMoyne College, Memphis, Tenn.	1870	Fred L. Brownlee	331	402	29	3,000	13,442
Lenoir-Rhyne College, Hickory, N. C.	1891	P. E. Monroe	560	870	31	450,000	18,000
Lesley Normal School, Cambridge, Mass.	1909	Edith L. Wolfard	137	—	23	—	2,579
Lewiston State Norm. Sch., Lewiston, Ida.	1893	John E. Turner	946	—	35	—	15,500
Limestone College, Gaffney, S. C.	1845	R. C. Granberry	360	—	27	416,000	19,250
Lincoln College, Lincoln, Ill.	1865	William D. Copeland	140	150	14	—	10,000
Lincoln Institute, Lincoln Ridge, Ky.	1911	Whitney Moore Young	231	279	17	230,000	5,000
Lincoln Memorial Univ., Harrogate, Tenn.	1894	S. W. McClelland	436	—	30	830,021	20,804
Lincoln University, Jefferson City, Mo.	1866	Sherman D. Scruggs	700	1,100	83	—	47,000
Lincoln University, Lincoln Univ., Pa.	1854	Walter L. Wright	388	—	29	1,025,904	39,000
Lindenwood College, St. Charles, Mo.	1827	Guy C. Motley	470	—	50	2,000,000	30,000
Linfield College, McMinnville, Ore.	1857	Wm. G. Everson	460	468	37	926,700	31,000
Livingstone College, Salisbury, N. C.	1879	William J. Trent	234	261	18	46,500	17,207
Long Island University, Brooklyn, N. Y.	1926	Tristram W. Metcalfe	905	1,206	59	500,000	17,000
Lon Morris College, Jacksonville, Tex.	1872	C. E. Peeples	268	300	14	100,061	6,723
Loras College, Dubuque, Iowa	1839	M. J. Martin	475	993	79	995,000	66,552
Loretto Heights College, Loretto, Colo.	1918	Paul J. Ketrick	150	151	30	—	15,000
Louisburg College, Louisburg, N. C.	1779	Walter Patten	282	283	21	58,758	6,000
Louisiana College, Pineville, La.	1906	Claybrook Cottingham	384	551	24	316,000	11,500
Louisiana Polytechnic Inst., Ruston, La.	1894	E. S. Richardson	2,133	3,160	137	—	22,811
*La. State Norm. Col., Natchitoches, La.	1884	Asa A. Fredericks	1,527	1,527	100	—	37,200
Louisiana State Univ., University, La.	1860	Paul M. Hebert	8,255	11,665	611	—	96,557
Lowell Textile Institute, Lowell, Mass.	1895	Charles H. Eames	324	1,380	65	—	2,765
Loyola College, Baltimore, Md.	1852	Edward B. Bunn	410	—	35	1,375,000	30,500
Loyola University, Chicago, Ill.	1870	Samuel K. Wilson	4,796	5,868	735	796,591	123,803
Loyola University, Los Angeles, Calif.	1865	Chas. A. McQuillan	762	942	45	—	26,160
Loyola Univ. of the South, New Orleans, La.	1912	Percy A. Roy	1,062	2,684	187	4,595,000	91,105

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
Luther College, Decorah, Iowa	1861	O. J. H. Preus	445	475	40	$ 550,000	60,000
Lynchburg College, Lynchburg, Va.	1903	R. B. Montgomery	252	306	22	291,072	17,573
M							
Macalester College, St. Paul, Minn.	1885	Charles J. Turck	678	—	52	1,996,270	33,550
MacMurray College, Jacksonville, Ill.	1846	C. P. McClelland	603	—	61	1,865,000	29,544
McGill University, Montreal, Canada	1821	F. Cyril James	2,927	3,102	591	20,447,998	401,667
McKendree College, Lebanon, Ill.	1828	Clark R. Yost	178	209	20	300,000	14,000
McMaster Univ., Hamilton, Ont., Can.	1887	H. P. Whidden	572	1,042	45	1,759,747	50,000
McMurry College, Abilene, Texas	1921	Frank L. Turner	440	760	36	57,527	13,500
McPherson College, McPherson, Kan.	1887	Vernon F. Schwalm	—	360	28	310,912	16,000
*Madawaska Tr. Sch., Fort Kent, Me.	1878	R. F. Crocker	159	159	10	—	3,000
Madison College, Madison College, Tenn.	1904	E. A. Sutherland	392	—	33	500,000	23,000
Maine, University of, Orono, Me.	1865	Arthur A. Hauck	2,076	2,649	179	1,013,539	141,000
Manchester College, No. Manchester, Ind.	1889	Otho Winger	640	1,150	40	633,083	33,185
Manhattan College, New York, N. Y.	1863	Brother A. Victor	1,160	1,421	105	—	61,903
Manhattanville Col. of Sac. Hrt., N. Y.	1841	Grace C. Dammann	303	418	66	—	40,907
Manitoba Law Sch., Winnipeg, Man., Can.	1914	Hugh A. Robson	48	—	12	—	2,800
Mansfield State Tch. Col., Mansfield, Pa.	1858	Lester K. Ade	547	750	66	—	21,795
Marian College, Indianapolis, Indiana	1936	Sister Mary John	91	280	32	—	15,000
Marietta College, Marietta, Ohio	1797	Harry Kelso Eversull	392	419	37	1,303,319	117,541
Marion College, Marion, Ind.	1920	Wm. F. McConn	200	277	24	80,917	11,444
Marion College, Marion, Virginia	1873	Hugh J. Rhyne	128	153	17	—	7,500
Marquette University, Milwaukee, Wis.	1881	R. C. McCarthy	3,174	5,197	416	2,053,107	124,685
Marshall, The College of, Marshall, Tex.	1912	F. S. Groner	360	415	20	—	9,320
Martin Luther Col., New Ulm, Minn.	1884	Carl L. Schweppe	195	—	13	—	9,033
Mary Baldwin College, Staunton, Va.	1842	L. Wilson Jarman	323	328	31	585,135	25,261
Marygrove College, Detroit, Mich.	1910	Sister M. Honora	620	1,348	64	—	30,699
Mary Hardin-Baylor College, Belton, Tex.	1845	Gordon G. Singleton	494	691	47	935,849	26,000
Maryland Col. for Women, Lutherville, Md.	1853	Wm. H. Moore, III	170	—	17	—	10,000
Maryland State Teachers College, Bowie, Maryland	1908	Leonidas S. James	150	—	17	58,325	7,980
Maryland, Univ. of, College Park, Md.	1807	H. C. Byrd	4,000	6,167	848	1,894,650	142,500
Marylhurst Normal Sch., Marylhurst, Ore.	1911	Sister M. F. Josephine	65	104	12	—	7,200
Marymount College, Salina, Kan.	1922	Mother Rose Waller	153	370	26	—	16,149
*Marymount College, Tarrytown, N. Y.	1907	M. Gerard	225	225	42	800,000	23,000
Maryville College, Maryville, Tenn.	1819	Ralph W. Lloyd	799	804	77	1,813,850	47,665
Maryville Col. of the Sac. Heart, St. Louis, Mo.	1872	Mother M. Mouton	172	—	28	300,000	22,000
Mary Washington Col., Fredericksburg, Va.	1908	Morgan L. Combs	1,400	—	100	—	30,216
Marywood College, Scranton, Pa.	1915	Mother M. Josepha	488	500	47	60,000	25,937
Mass. Inst. of Tech., Cambridge, Mass.	1865	Karl T. Compton	3,100	4,655	683	36,012,773	350,000
Mass. State College, Amherst, Mass.	1863	Hugh P. Baker	1,204	1,824	135	159,000	122,066
Mass. State Tch. Col., Bridgewater, Mass.	1840	John J. Kelly	545	550	40	—	12,041
Mass. State Tch. Col., Fitchburg, Mass.	1895	Charles M Herlihy	279	367	45	—	21,000
Mass. State Tch. Col., Framingham, Mass.	1839	Martin F. O'Connor	462	—	34	—	15,000
*Mass. State Tch. Col., Hyannis, Mass.	1897	Herbert H. Howes	148	154	11	—	12,800
Mass. State Tch. Col., Lowell, Mass.	1897	James Dugan	276	—	14	—	9,000
Mass. State Tch. Col., Salem, Mass.	1854	Edward A. Sullivan	490	—	26	—	15,000
Mass. State Tch. Col., Worcester, Mass.	1874	Clinton E. Carpenter	184	191	21	—	15,000
Mercer University, Macon, Ga.	1833	Spright Dowell	500	750	29	750,000	53,000
Mercyhurst College, Erie, Pa.	1926	Mother M. Borgia	370	—	32	1,500,000	15,000
Meredith College, Raleigh, N. C.	1891	Carlyle Campbell	486	517	63	538,819	23,000
Miami, Univ. of, Coral Gables, Fla.	1925	Bowman Foster Ashe	1,360	1,811	96	—	45,394
Miami University, Oxford, Ohio	1809	A. H. Upham	3,270	4,378	203	110,000	162,000
Mich. Col. of Mng. & Tech., Houghton, Mich.	1885	Grover C. Dillman	871	—	79	—	39,305
Michigan State Col., E. Lansing, Mich.	1855	Robert S. Shaw	7,052	7,836	436	—	152,263
Mich. State Normal Col., Ypsilanti, Mich.	1849	John M. Munson	3,456	3,563	187	—	100,325
Michigan, University of, Ann Arbor, Mich.	1817	Alexander G. Ruthven	13,011	—	773	14,764,123	1,098,107
Middlebury College, Middlebury, Vt.	1800	Paul Dwight Moody	793	1,579	70	4,397,785	131,000
Middlesex University, Boston, Mass.	1849	C. Ruggles Smith	580	640	85	—	5,000
Midland College, Fremont, Neb.	1887	F. C. Wiegman	312	455	28	153,000	18,500
Miles Memorial College, Birmingham, Ala.	1902	W. A. Bell	486	530	22	—	7,000
Millersville St. Tch. Col., Millersville, Pa.	1854	Landis Tanger	530	660	45	—	25,000
Milligan College, Milligan College, Tenn.	1881	C. E. Burns	300	—	22	115,000	15,196
Mills College, Oakland, Calif.	1852	Aurelia H. Reinhardt	636	941	104	1,886,042	77,285
Millsaps College, Jackson, Miss.	1892	Marion L. Smith	560	789	35	784,407	26,750
Milton College, Milton, Wis.	1867	J. G. Meyer	198	205	22	240,000	15,600
Milwaukee-Downer Col., Milwaukee, Wis.	1895	Lucia R. Briggs	310	314	48	2,070,111	40,000
*Milwaukee School of Eng., Mlwke., Wis.	1903	Oscar Werwath	414	500	33	—	600
Minn. State Tch. Col., Bemidji, Minn.	1919	Charles R. Sattgast	501	832	37	—	17,000
Minn. State Tch. Col., Mankato, Minn.	1868	Frank D. McElroy	812	—	54	—	24,456
Minn., University of, Minneapolis, Minn.	1851	Guy Stanton Ford	12,395	19,525	1009	17,295,221	1,120,294
Misericordia College, Dallas, Pa.	1924	Sister Mary Pierre	250	677	15	1,100,000	17,160
Mission House College, Plymouth, Wis.	1862	Paul Grosshuesch	183	—	21	62,623	12,350
Mississippi College, Clinton, Miss.	1826	D. M. Nelson	455	617	25	633,000	22,000
Miss. So. Col., Hattiesburg, Miss.	1910	J. B. George	640	—	54	$ —	23,000
Miss. State Col., State College, Miss.	1878	G. D. Humphrey	2,091	3,058	148	—	77,545
Miss. St. Col. for Women, Columbus, Miss.	1884	B. L. Parkinson	1,140	1,167	75	—	50,000
Mississippi, University of, Oxford, Miss.	1844	A. B. Butts	1,415	—	110	733,808	77,880
*Miss. Woman's Col., Hattiesburg, Miss.	1912	W. E. Holcomb	153	153	20	503,000	13,000
Missouri, University of, Columbia, Mo.	1839	F. A. Middlebush	8,320	8,320	394	1,938,080	396,126
Missouri Valley College, Marshall, Mo.	1889	Thomas W. Bibb	300	325	22	650,000	28,000
Mitchell College, Statesville, N. C.	1853	Grace K. Ramsay	180	194	15	10,000	5,420
Monmouth College, Monmouth, Ill.	1857	James Harper Grier	535	633	46	1,806,449	40,000
Montana School of Mines, Butte, Mont.	1893	Francis A. Thomson	351	—	25	800,000	16,000
Montana State College, Bozeman, Mont.	1893	A. L. Strand	1,756	1,801	201	—	59,451
Montana State Normal Col., Dillon, Mont.	1893	Sheldon E. Davis	280	601	39	—	22,759
Montana State Univ., Missoula, Mont.	1893	George F. Simmons	1,817	2,578	92	114,869	239,590
Montreal University, Montreal, Canada	1882	Mgr. Olivier Maurault	8,935	—	834	150,000	53,000
Moorhead St. Tch. Col., Moorhead, Minn.	1887	Ray B. MacLean	683	—	52	—	21,831
Moravian Col. & Theol. Sem., Beth., Pa.	1807	W. N. Schwarze	200	210	20	710,526	22,500
Moravian Sem. & Col. for Wom., Beth., Pa.	1742	Edwin J. Heath	275	300	40	228,162	9,000
Morehead St. Tch. Col., Morehead, Ky.	1923	W. H. Vaughan	760	800	61	—	14,000
Morgan St. College, Baltimore, Md.	1867	D. O. W. Holmes	428	1,118	40	—	29,209
Morningside College, Sioux City, Iowa	1894	Earl A. Roadman	653	720	47	319,097	44,000
Morris Brown College, Atlanta, Ga.	1881	W. A. Fountain, Jr.	479	591	30	—	6,448
Morris Harvey College, Charleston, W. Va.	1888	Leonard Riggleman	527	1,715	53	215,000	11,000
Morristown Norm. & Indus. Col., Tenn.	1881	J. W. Haywood	160	—	10	60,000	8,000
Mount Allison Univ., Sackville, N. B., Can.	1840	George J. Trueman	482	607	56	1,038,170	48,000
Mt. Angel Col. & Sem., St. Benedict, Ore.	1887	Thomas Meier	165	205	35	96,000	43,000
Mount Holyoke Col., So. Hadley, Mass.	1837	Roswell G. Ham	1,046	1,099	131	5,346,488	165,000
Mt. St. Jos.-on-the-Ohio, Col. of, Cincin., O.	1920	Sister Maria Corona	276	287	41	650,000	18,500
Mt. St. Mary Sem. of West, Norwood, Ohio	1829	John T. McNicholas	235	—	11	—	22,885
Mt. St. Mary's Col., Emmitsburg, Md.	1808	John L. Sheridan	291	358	30	260,000	45,000
Mt. St. Mary's Col., Los Angeles, Calif.	1925	Sister M. Dolorosa	200	475	32	—	12,000
Mt. St. Scholastica Col., Atchison, Kan.	1930	Mother Lucy Dooley	305	668	37	—	21,048
Mt. St. Vincent, College of, New York, N.Y.	1910	Sister Catharine Marie	411	491	45	213,240	26,753
Mount Union College, Alliance, Ohio	1846	Charles B. Ketcham	533	697	45	1,468,444	63,500
Muhlenberg College, Allentown, Pa.	1848	Levering Tyson	525	785	36	984,000	60,000
Mundelein College, Chicago, Ill.	1929	Sister M. Justitia	524	531	60	—	18,850
Murray State Teachers Col., Murray, Ky.	1923	James H. Richmond	1,116	1,687	83	—	25,971
Muskingum College, New Concord, Ohio	1837	Robt. N. Montgomery	767	1,166	65	918,000	31,000
N							
Nasson College, Springvale, Me.	1912	Dawn N. Wallace	175	—	16	—	5,000
National College of Edu., Evanston, Ill.	1886	Edna Dean Baker	474	899	70	56,482	20,894
National University, Washington, D. C.	1869	Leslie C. Garnett	—	725	39	—	8,000
Nazareth College, Nazareth, Mich.	1924	Sister M. Kevin	218	238	24	—	20,000
Nebraska Central Col., Central City, Neb.	1899	O. W. Carrell	60	82	9	50,000	5,000
Neb. State Teachers Col., Chadron, Neb.	1911	E. L. Rouse	399	679	53	—	24,733
Nebraska, University of, Lincoln, Neb.	1869	C. S. Boucher	6,452	9,414	442	961,816	353,431
Neb. Wesleyan Univ., Lincoln, Neb.	1888	Benj. F. Schwartz	394	497	46	975,895	30,686
Nevada, University of, Reno, Nev.	1874	L. W. Hartman	1,267	1,418	83	278,835	63,210
Newark Col. of Engin., Newark, N. J.	1881	Allan R. Cullimore	964	1,111	96	88,195	15,000
Newark, University of, Newark, N. J.	1934	George H. Black	950	1,075	65	183,289	24,000
Newberry College, Newberry, S. C.	1856	James C. Kinard	398	408	25	330,000	20,000
New Bruns., Univ. of, Fredericton, N.B., Can.	1800	N. A. M. MacKenzie	360	470	25	194,000	30,000
Newcomb Mem. Col., New Orleans, La.	1886	Frederick Hard	652	663	70	2,967,395	44,617
New Hampshire, Univ. of, Durham, N. H.	1866	Fred Engelhardt	2,013	2,537	201	1,245,625	103,000
New Haven St. Tch. Col., N. H., Conn.	1893	Finis E. Engleman	318	—	21	—	17,500
N. J. State Tch. Col., Newark, N. J.	1913	Roy L. Shaffer	550	1,326	42	—	34,946
N. J. State Tch. Col., Trenton, N. J.	1855	Roscoe L. West	792	1,028	70	—	35,200
N. J. St. Tch. Col., Upper Montclair, N. J.	1908	Harry A. Sprague	667	1,224	51	—	38,127
New Mex. Mil. Inst., Roswell, N. M.	1895	Daniel C. Pearson	596	—	50	—	17,633
New Mex. School of Mines, Socorro, N. M.	1889	C. E. Needham	148	150	13	—	6,000
N. M. Col. Agri. & Mech. Arts, St. Col., N.M.	1862	Hugh M. Milton II	841	921	169	329,649	39,781
N. Mex. St. Tch. Col., Silver City, N. M.	1893	Haddon W. James	211	239	42	—	24,435
New Mex., Univ. of, Albuquerque, N. M.	1889	James F. Zimmerman	1,773	2,771	110	796,253	82,386
New Rochelle, Col. of, New Rochelle, N. Y.	1904	Francis W. Walsh	759	765	56	37,004	40,050
N. Y., Col. of the City of, N. Y., N. Y.	1847	Nelson P. Mead	8,680	30,567	989	—	245,015
N. Y. St. Col. of Forestry, Syracuse, N. Y.	1911	Samuel N. Spring	515	—	50	—	52,468
N. Y. St. Col. for Tch., Albany, N. Y.	1844	John M. Sayles	1,203	2,373	94	—	28,890
N. Y. St. Normal Sch., Brockport, N. Y.	1867	E. C. Hartwell	350	450	30	—	16,000
N. Y. State Norm. Sch., Fredonia, N. Y.	1866	Leslie R. Gregory	500	800	50	—	22,000
N. Y. State Normal School, Geneseo, N. Y.	1867	James B. Welles	446	703	29	—	26,143
N. Y. State Normal School, Oneonta, N. Y.	1889	Charles W. Hunt	376	—	40	—	22,040
N. Y. State Normal School, Oswego, N. Y.	1861	Ralph W. Swetman	463	—	35	—	21,748
N. Y. State Normal School, Potsdam, N. Y.	1866	Clarence O. Lehman	478	688	49	—	14,742
N. Y. St. Norm. & Tr. Sch., New Paltz, N.Y.	1886	L. H. van den Berg	414	703	48	—	17,493
N. Y. State Tch. Col., Buffalo, N. Y.	1872	Harry W. Rockwell	1,000	1,700	75	—	24,975

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
New York University, New York, N. Y.	1831	Harry W. Chase	13,784	39,964	2192	$ 8,502,445	592,041
Niagara Univ., Niagara Univ., N. Y.	1856	Joseph M. Noonan	1,273	1,444	90	—	35,361
N. C. Agri., Col. of, Greensboro, N. C.	1891	Ferdinand D. Bluford	903	2,300	76	—	27,000
N. C. College for Negroes, Durham, N. C.	1925	James E. Shepard	723	1,239	54	—	20,865
North Carolina, University of, Chapel Hill, N. C.	1793	Frank Porter Graham	4,098	6,286	467	2,785,546	386,390
North Central College, Naperville, Ill.	1861	Edward E. Rall	556	568	45	998,400	25,000
N. D. Agri. Col., Fargo, N. D.	1890	Frank L. Eversull	1,714	—	213	—	63,000
N. D. Sch. of Forestry, Bottineau, N. D.	1907	Albert F. Arnason	150	—	10	—	4,000
N. D. St. Nor. & Ind. Sch., Ellendale, N. D.	1899	John C. McMillan	430	546	23	—	18,000
N. D. St. Sch. of Sc., Wahpeton, N. D.	1907	E. F. Riley	600	800	38	—	5,000
N. D. St. Tch. Col., Dickinson, N. D.	1918	Chas. E. Scott	461	—	31	—	11,000
N. D. St. Tch. Col., Mayville, N. D.	1889	Cyril W. Grace	387	—	25	—	18,600
N. D. St. Tch. Col., Minot, N. D.	1913	C. C. Swain	903	1,308	48	—	27,527
N. D., University of, Grand Forks, N. D.	1883	John C. West	1,592	2,117	130	1,700,000	131,600
N. E. Mo. St. Tch. Col., Kirksville, Mo.	1867	Walter H. Ryle	965	2,265	70	—	56,878
N. E. St. Col., Tahlequah, Okla.	1846	John Vaughan	1,667	—	54	—	30,485
Northeastern Univ., Boston, Mass.	1898	Carl Stephens Ell	2,797	6,565	357	323,187	27,281
Nor. Ill. State Tch. Col., DeKalb, Ill.	1895	Karl Langdon Adams	1,173	—	79	—	48,256
Nor. State Tch. Col., Aberdeen, S. D.	1901	N. E. Steele	814	830	52	—	23,174
Nor. State Tch. Col., Marquette, Mich.	1899	Henry S. Tape	679	1,303	56	—	34,045
North Georgia College, Dahlonega, Ga.	1873	J. C. Rogers	595	815	31	—	9,596
Northland College, Ashland, Wis.	1892	Joseph D. Brownell	230	250	21	130,000	30,000
North Tex. Agri. Col., Arlington, Tex.	1917	E. E. Davis	1,609	—	76	—	17,405
Nor. Tex. State Tch. Col., Denton, Tex.	1890	W. Joseph McConnell	3,500	6,500	200	—	103,000
N. W. Mo. State Tch. Col., Maryville, Mo.	1905	Uel W. Lamkin	878	880	54	—	25,000
Northwest Nazarene Col., Nampa, Ida.	1913	Russell V. De Long	371	400	32	—	7,000
Northwestern College, Watertown, Wis.	1865	Erwin E. Kowalke	214	—	18	82,117	10,882
Northwestern State College, Alva, Okla.	1897	Chester O. Newlun	753	1,243	43	—	17,642
Northwestern University, Evanston, Ill.	1851	Franklyn B. Snyder	6,325	22,426	962	23,147,640	350,000
Norwich University, Northfield, Vt.	1819	John M. Thomas	465	—	35	750,000	35,000
Notre Dame College, South Euclid, Ohio	1922	Mother Mary Evarista	200	203	36	—	21,398
Notre Dame of Md., Col. of, Balti., Md.	1895	Sister Mary Frances	228	370	38	1,427,250	18,252
Notre Dame, Univ. of, Notre Dame, Ind.	1842	J. Hugh O'Donnell	3,268	4,435	201	1,010,100	228,398
Nova Scotia Agri. Col., Truro, N. S., Can.	1905	L. C. Harlow	84	366	11	—	8,000
Nova Scotia Normal Col., Truro, N.S., Can.	1855	D. G. Davis	300	—	12	—	5,530
Nova Scotia Tech. Col., Halifax, N. S., Can.	1908	F. H. Sexton	57	—	9	—	100,000
O							
Oakland City Col., Oakland City, Ind.	1890	L. A. Stone	100	115	10	300,000	8,240
Oberlin College, Oberlin, Ohio	1833	Ernest H. Wilkins	1,764	1,889	176	19,416,966	404,715
Occidental College, Los Angeles, Calif.	1887	Remsen D. Bird	779	—	70	1,228,359	59,877
Oglethorpe University, Atlanta, Ga.	1913	Thornwell Jacobs	900	—	30	—	60,000
Ohio Northern Univ., Ada, Ohio	1871	Robert Williams	701	722	41	403,521	22,900
Ohio State University, Columbus, Ohio	1870	H. L. Bevis	13,016	18,003	1339	1,636,670	563,922
Ohio University, Athens, Ohio	1804	Herman G. James	3,500	4,803	250	—	120,000
Ohio Wesleyan Univ., Delaware, Ohio	1842	H. J. Burgstahler	1,515	1,529	117	3,489,000	158,141
Okla. Agri. & Mech. Col., Stillwater, Okla.	1891	Henry G. Bennett	6,500	7,000	307	—	127,000
Okla. Baptist Univ., Shawnee, Okla.	1906	John W. Raley	878	970	32	25,000	15,000
Okla. Col. for Women, Chickasha, Okla.	1908	M. A. Nash	1,050	1,150	70	—	23,000
Oklahoma, University of, Norman, Okla.	1890	William B. Bizzell	6,178	8,026	301	3,752,583	250,000
Olivet College, Olivet, Mich.	1844	Joseph Brewer	271	—	30	203,338	43,200
Olivet Nazarene College, Kankakee, Ill.	1908	A. L. Parrott	434	505	33	—	—
Omaha, Municipal Univ. of, Omaha, Neb.	1908	Rowland Haynes	1,208	1,845	64	13,568	65,000
Ontario Agri. Col., Guelph, Ont., Can.	1874	George I. Christie	803	2,837	105	—	43,720
Ontario College of Art, Toronto, Ont., Can.	1912	Fred S. Haines	121	131	15	—	1,500
Ontario Veterinary Col., Guelph, Ont., Can.	1862	Charles D. McGilvray	200	250	21	—	—
Oregon Coll. of Ed., Monmouth, Ore.	1882	C. A. Howard	850	—	46	—	26,063
Oregon State College, Corvallis, Ore.	1868	Frank L. Ballard	5,083	7,925	347	32,609	174,687
Oregon, University of, Eugene, Ore.	1872	Donald M. Erb	3,600	4,800	275	759,820	300,000
Osgoode Hall Law Sch., Toronto, Ont., Can.	1873	John D. Falconbridge	276	—	12	—	81,450
Ottawa University, Ottawa, Kan.	1865	Andrew B. Martin	283	336	24	459,700	18,800
Otterbein College, Westerville, Ohio	1847	J. Ruskin Howe	451	493	41	1,304,051	28,818
Ouachita College, Arkadelphia, Ark.	1886	James Richard Grant	558	583	35	579,000	18,000
Our Lady of Elms, Col. of, Chicopee, Mass.	1928	Thomas M. O'Leary	142	—	18	—	15,000
Our Lady of the Lake Col., San Ant., Tex.	1896	Mother M. Angelique	283	1,364	54	238,633	43,124
Ozarks, The Col. of the, Clarksville, Ark.	1891	Wiley Lin Hurie	270	323	25	402,253	19,000
P							
Pacific College, Newberg, Ore.	1891	Levi T. Pennington	85	95	15	222,621	10,000
Pacific, College of the, Stockton, Calif.	1851	Tully C. Knoles	336	802	86	572,234	39,500
Pacific Union College, Angwin, Calif.	1882	Walter I. Smith	458	782	43	—	26,284
Pacific University, Forest Grove, Ore.	1849	Walter C. Giersbach	320	330	24	350,000	28,000
Paine College, Augusta, Ga.	1882	Edmund C. Peters	336	366	21	35,000	17,000
Park College, Parkville, Mo.	1875	William L. Young	527	—	40	1,281,255	35,000
Parsons College, Fairfield, Iowa	1875	Horace Gunthorp	340	—	30	—	22,464

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
Pasadena College, Pasadena, Calif.	1902	H. Orton Wiley	250	411	30	$ —	12,000
Penn, William, Col., Oskaloosa, Iowa	1873	Henry Edwin McGrew	313	343	24	19,995	48,830
Pa. Col. for Women, Pittsburgh, Pa.	1869	Herbert L. Spencer	310	328	37	602,678	23,000
Pa. Military College, Chester, Pa.	1821	Frank K. Hyatt	185	—	22	—	9,000
Pa. State College, The, State College, Pa.	1855	Ralph D. Hetzel	7,475	10,959	656	517,000	210,000
Pa. State Teachers College, California, Pa.	1855	Robert M. Steele	611	1,574	52	—	18,000
Pa. State Tch. Col., Clarion, Pa.	1867	Paul G. Chandler	307	657	26	—	18,000
Pa. State Tch. Col., E. Stroudsburg, Pa.	1893	Joseph F. Noonan	487	527	72	—	18,201
Pa. State Teachers Col., Edinboro, Pa.	1861	L. H. Van Houten	262	530	26	—	22,000
Pa. State Tch. Col., Lock Haven, Pa.	1870	John G. Flowers	408	700	35	—	25,000
Pa. State Tch. Col., Shippensburg, Pa.	1871	Albert L. Rowland	478	847	42	13,500	22,600
Pa. State Tch. Col., Slippery Rock, Pa.	1889	Dale McMaster	545	622	54	—	27,790
Pennsylvania, Univ. of., Philadelphia, Pa.	1740	Thomas S. Gates	11,619	15,970	1625	22,323,269	901,000
Pestalozzi Froebel Tch. Col., Chicago, Ill.	1895	Herman H. Hegner	85	289	31	—	5,317
Philander Smith Col., Little Rock, Ark.	1877	M. LaF. Harris	391	591	36	92,000	14,029
Phillips University, Enid, Okla.	1907	Eugene S. Briggs	732	867	36	672,079	37,139
Piedmont College, Demorest, Ga.	1897	M. B. Dana	240	345	20	200,000	18,000
Pittsburgh, Univ. of, Pittsburgh, Pa.	1787	John G. Bowman	8,447	12,920	1177	3,041,457	370,387
Plymouth Teachers College, Plymouth, N.H.	1870	Ernest L. Silver	207	367	18	—	18,000
Polytechnic-Intermountain College, Billings, Montana	1878	J. S. Pennepacker	143	341	12	218,494	30,000
Pomona College, Claremont, Calif.	1887	Charles K. Edmunds	841	959	76	3,808,996	95,554
Pontifical Institute of Mediaeval Studies, The, Toronto, Ont. Can.	1929	Gerald B. Phelan	26	49	12	—	14,000
Portland, Univ. of, Portland, Ore.	1901	Chas. C. Miltner	790	804	55	6,000	12,000
Prairie View State Col., Prairie View, Tex.	1876	W. R. Banks	1,202	2,010	91	—	21,500
Pratt Institute, Brooklyn, N. Y.	1887	Charles Pratt	1,881	5,205	245	8,000,000	144,327
Presbyterian College, Clinton, S. C.	1880	William P. Jacobs	312	355	24	79, 09	21,000
Presbyterian College, Montreal, Que., Can.	1865	F. Scott Mackenzie	42	—	6	277,741	12,500
Princeton University, Princeton, N. J.	1746	Harold W. Dodds	2,700	2,707	374	36,506,900	960,000
Principia Col. of Lib. Arts, Elsah, Ill.	1910	Frederic E. Morgan	331	—	29	622,045	36,649
Providence College, Providence, R. I.	1919	John J. Dillon	842	967	70	—	30,000
Prov. Inst. Tech. & Art, Calg., Alta., Can.	1916	W. G. Carpenter	563	1,226	33	—	2,400
Puerto Rico, Univ. of, Rio Piedras, P. R.	1903	Juan B. Soto	3,965	6,663	295	—	63,145
Puget Sound, College of, Tacoma, Wash.	1888	Edward H. Todd	673	1,113	53	1,200,000	38,000
Purdue University, Lafayette, Ind.	1869	Edward C. Elliott	6,540	8,833	496	340,000	154,388
Q							
Queens College, Charlotte, N. C.	1857	Hunter B. Blakely	435	—	36	319,112	18,000
Queen's University, Kingston, Ont., Can.	1841	Robert C. Wallace	1,693	1,819	252	4,000,000	193,546
R							
Radcliffe College, Cambridge, Mass.	1879	Ada L. Comstock	833	989	400	5,452,420	80,000
Radford State Tch. Col., Radford, Va.	1913	David W. Peters	540	563	54	—	29,587
Randolph-Macon College, Ashland, Va	1830	J. Earl Moreland	304	—	18	1,067,508	32,500
Rdlph.-Macon Wom. Col., Lynchburg, Va.	1893	Theodore H. Jack	661	670	73	1,246,130	52,000
Redlands, University of, Redlands, Calif.	1909	Elam J. Anderson	853	1,122	65	3,415,747	55,581
Reed College, Portland, Ore.	1911	Dexter M. Keezer	495	545	60	1,814,865	65,000
Regis College, Denver, Colo.	1888	Robt. M. Kelley	226	234	25	47,500	43,551
Regis College, Weston, Mass.	1927	Sister Genevieve Marie	474	800	48	—	20,000
Rensselaer Poly. Inst., Troy, N. Y.	1824	Wm. O. Hotchkiss	1,492	1,816	160	5,369,600	32,000
R. I. Col. of Edu., Providence, R. I.	1920	Lucius A. Whipple	488	922	63	—	45,667
Rhode Island State Col., Kingston, R. I.	1888	John Barlow	1,239	1,254	113	—	57,364
Rice Institute, Houston, Texas	1912	Edgar O. Lovett	1,450	—	94	15,543,000	151,000
Richmond, University of, Richmond, Va.	1832	F. W. Boatwright	1,090	1,920	95	2,950,448	95,000
Rio Grande College, Rio Grande, Ohio.	1876	R. Lloyd Pobst	207	297	14	70,500	9,000
Ripon College, Ripon, Wis.	1851	Silas Evans	506	—	36	898,300	35,000
River Falls St. Tch. Col., River Falls, Wis.	1874	J. H. Ames	653	979	45	—	25,000
Roanoke College, Salem, Va.	1842	Charles J. Smith	347	539	30	650,000	20,000
Rochester, University of, Rochester, N. Y.	1850	Alan Valentine	2,297	3,657	496	52,340,057	360,184
Rockford College, Rockford, Ill.	1847	Mary Ashby Cheek	287	299	50	992,835	27,931
Rockhurst College, Kansas City, Mo.	1910	William Hugh McCabe	301	648	37	—	20,000
*Rosary College, River Forest, Ill.	1922	Sister Mary Evelyn	506	555	65	108,861	40,385
Rosemont College, Rosemont, Pa.	1922	Mother M. Cleophas	282	348	42	—	25,300
Rose Polytechnic Inst., Terre Haute, Ind.	1874	Donald B. Prentice	283	—	28	1,679,735	21,000
Russell Sage College, Troy, N. Y.	1916	James L. Meader	682	693	79	1,041,713	27,552
*Rust College, Holly Springs, Miss.	1866	Lee M. McCoy	221	546	22	30,000	14,000
Rutgers University, New Brunswick, N. J.	1766	Robt. C. Clothier	2,959	4,130	405	5,000,000	309,728
S							
*Sacred Heart College, Louisville, Ky.	1864	Sister M. Dominica	85	85	26	—	11,609
St. Ambrose College, Davenport, Iowa	1882	Ambrose J. Burke	607	1,234	68	740,000	25,000

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
St. Andrew's College, Saskatoon, Sask., Can.	1912	David S. Dix	52	—	4	$ —	3,500
St. Ann's College, Church Point, N. S., Can.	1890	Jules Comeau	150	—	20	—	10,000
St. Anselm's College, Manchester, N. H.	1893	Bertrand C. Dolan	275	—	31	—	13,000
St. Benedict's College, Atchison, Kan.	1858	Martin Veth	290	—	38	—	80,000
St. Benedict, College of, St. Joseph, Minn.	1914	Mother Rosamond	278	—	43	—	25,000
St. Bonaventure Col., St. Bonvtre., N. Y.	1854	Thomas Plassmann	428	901	70	—	44,502
*St. Catherine, College of, St. Paul, Minn.	1903	Sister Eucharista	642	905	63	3,555,750	56,000
St. Cloud St. Tch. Col., St. Cloud, Minn.	1869	George A. Selke	—	1,892	75	—	43,667
St. Edward's University, Austin, Texas	1878	S. F. Lisewski	225	—	33	—	22,176
St. Elizabeth, Col. of, Convent Sta., N. J.	1899	Sister Marie J. Byrne	426	812	45	—	23,000
St. Francis College, Brooklyn, N. Y.	1858	Rev. Brother Columba	236	—	26	—	11,000
St. Francis College, Burlington, Wis.	1930	Isidore Cwiklinski	32	—	6	—	2,000
St. Francis, College of, Joliet, Ill.	1925	Sister M. Aniceta	176	641	40	—	20,000
St. Francis College, Loretto, Pa.	1847	John P. J. Sullivan	234	238	27	1,127,000	17,000
St. John's College, Annapolis, Md.	1784	Stringfellow Barr	175	—	26	205,192	34,851
St. John's Lutheran Col., Winfield, Kan.	1893	Carl S. Mundinger	108	119	17	20,000	11,000
St. John's University, Brooklyn, N. Y.	1870	Edward J. Walsh	7,558	9,062	343	—	55,500
St. John's University Collegeville, Minn.	1857	Alcuin Deutsch	487	—	52	—	70,000
St. Joseph's College, Emmitsburg, Md.	1809	Sister Paula Dunn	190	250	39	—	13,514
St. Joseph's College, Philadelphia, Pa.	1852	Thomas J. Love	485	—	37	—	16,598
St. Joseph's College, Princeton, N. J.	1914	A. deC. Hamilton	97	—	15	—	10,000
Saint Joseph College, West Hartford, Conn.	1932	Mother M. Rinaldo	263	793	32	—	12,600
St. Joseph's Col. for Women, Brooklyn, N.Y.	1916	William T. Dillon	443	—	44	—	17,000
St. Joseph's Col. for Women, Portland, Me.	1915	Joseph E. McCarthy	68	219	12	—	1,373
St. Lawrence University, Canton, N. Y.	1856	Millard H. Jencksm	715	1,004	70	2,267,133	74,005
St. Louis University, St. Louis, Mo.	1818	H. B. Crimmins	3,546	7,163	685	1,800,000	352,958
St. Mary College, Leavenworth, Kan.	1923	Arthur M. Murphy	259	530	53	—	21,000
St. Mary, College of, Omaha, Neb.	1923	Mother M. Gerard	123	126	18	—	8,450
St. Mary of the Lake Sem., Mundelein, Ill.	1921	Reynold Hillenbrand	274	—	29	—	80,000
St. Mary of the Springs Col., Columbus, O.	1912	Sister M. Aloyse	150	350	40	—	25,000
St. Mary-of-Wasatch, Col. of, Slt. Lk. Cty., U.	1926	Sister Mary Agnes	85	184	17	—	12,229
St. Mary-of-the-Woods Col., Indiana	1840	Mother Mary Bernard	239	1,010	41	612,500	54,000
St. Mary's College, Halifax, N. S., Canada	1841	C. J. Keating	260	—	17	—	10,131
St. Mary's Col., Notre Dame, Holy Cross, Ind.	1844	Sister Mary Madeleva	357	641	59	100,000	25,876
*St. Mary's College, St. Mary, Ky.	1821	A. A. Eicheldinger	85	85	8	—	3,300
St. Mary's College, St. Mary's Col., Calif.	1863	Brother Albert	503	—	55	—	70,000
*St. Mary's College, St. Mary's, Kan.	1848	Adam C. Ellis	196	196	26	—	30,000
St. Mary's College, Winona, Minn.	1912	Brother Leopold	322	351	30	—	20,000
St. Mary's Sem. & Univ., Baltimore, Md.	1791	John F. Fenlon	510	—	30	—	55,000
St. Mary's University, San Antonio, Tex.	1852	Walter F. Golatka	449	1,237	44	—	28,000
St. Michael's College, Toronto, Ont., Can.	1852	Terence P. McLaughlin	300	—	29	—	25,000
St. Michael's College, Winooski Park, Vt.	1904	J. E. Petty	215	266	23	—	20,000
St. Norbert College, West De Pere, Wis.	1898	Bernard H. Pennings	336	823	51	—	21,500
St. Olaf College, Northfield, Minn.	1874	L. W. Boe	1,147	1,166	78	949,196	49,339
St. Paul Norm. & Indus. Sch. Lwrencville., Va.	1888	J. Alvin Russell	975	1,000	60	185,000	7,850
St. Peter's College, Jersey City, N. J.	1872	Dennis J. Comey	405	—	30	—	16,000
St. Procopius College, Lisle, Ill.	1890	Procopius Neuzil	103	—	21	—	31,000
St. Rose, College of, Albany, N. Y.	1920	Edmund Gibbons	350	490	30	—	9,050
*St. Teresa, College of, Winona, Minn.	1911	Sister M. A. Molloy	466	779	51	—	28,630
St. Thomas, College of, St. Paul, Minn.	1885	James H. Moynihan	855	—	55	—	31,887
St. Vincent College, Latrobe, Pa.	1846	Alfred Koch	310	360	44	—	60,000
Salem College, Salem, W. Va.	1888	S. Orestes Bond	260	527	22	158,113	14,300
Salem College, Winston-Salem, N. C.	1772	H. E. Rondthaler	340	360	40	449,817	19,500
San Antonio, Univ. of, San Antonio, Texas	1894	W. W. Jackson	284	634	28	—	9,358
San Francisco Col. for Wom., San Fran., Cal.	1930	Mother Leonor Mejia	158	363	35	—	100,000
San Francisco, Univ. of, San Fran., Calif.	1855	William J. Dunne	805	1,294	77	—	60,500
San Jose State College, San Jose, Calif.	1857	T. W. MacQuarrie	4,076	5,230	200	—	70,000
Santa Barbara St. Col., Santa Barbara, Cal.	1913	Clarence L. Phelps	1,747	2,586	94	—	35,172
Santa Clara, Univ. of, Santa Clara, Calif.	1851	Charles J. Walsh	514	—	55	—	60,000
Sarah Lawrence College, Bronxville, N. Y.	1926	Constance Warren	289	290	57	488,896	34,350
Saskatchewan Univ., Saskatoon, Sask., Can.	1908	James S. Thomson	1,948	2,700	139	—	75,000
Scripps College, Claremont, Calif.	1927	Ernest J. Jaqua	220	—	30	797,220	22,715
Seattle Pacific College, Seattle, Wash.	1891	Chas. Hoyt Watson	316	394	35	83,406	16,210
*Seton Hall College, South Orange, N. J.	1856	James F. Kelley	581	1,763	125	86,992	17,000
Seton Hill College, Greensburg, Pa.	1883	James A. Reeves	500	550	54	500,000	27,000
Shaw University, Raleigh, N. C.	1865	Robert P. Daniel	458	468	30	387,000	16,400
Shenandoah College, Dayton, Va.	1875	Wade S. Miller	170	—	20	45,900	6,679
Shepherd St. Tch. Col., Shepherdstwn., W. Va.	1872	W. H. S. White	320	600	20	—	16,100
Shorter College, Rome, Ga.	1873	Paul M. Cousins	229	230	27	500,000	20,000
Shurtleff College, Alton, Ill.	1826	Guy Wimmer	248	525	25	200,000	20,000
Simmons College, Boston, Mass.	1899	Bancroft Beatley	1,392	1,638	160	3,428,381	88,802
Simmons University, Louisville, Ky.	1873	M. B. Lanier	71	—	13	—	1,200
Simpson College, Indianola, Iowa	1860	John Owen Gross	537	690	35	1,400,000	30,000
Sioux Falls College, Sioux Falls, S. D.	1883	W. P. Behan	226	228	27	252,296	15,000
Sisters College of Cleveland, Cleveland, O.	1928	Jos. Schrembs	123	708	33	—	19,441
Skidmore College, Saratoga Springs, N. Y.	1911	Henry T. Moore	805	—	78	890,486	53,483
Smith College, Northampton, Mass.	1871	Herbert Davis	2,065	—	246	6,417,963	276,775
Snow College, Ephraim, Utah	1888	James A. Nuttall	245	249	21	$ —	8,625
South Dakota State Col., Brookings, S. D.	1881	Lyman E. Jackson	1,405	1,698	139	555,720	64,602
So. Dak. St. Sch. of Mines, Rapid City, S. D.	1885	Joseph P. Connolly	371	—	35	—	16,000
South Dakota, Univ. of, Vermillion, S. D.	1882	I. D. Weeks	—	933	111	—	100,000
S. E. Mo. St. Tch. Col., Cape Girardeau, Mo.	1872	Walter W. Parker	1,200	—	60	—	70,000
Southeastern State College, Durant, Okla.	1909	T. T. Montgomery	1,101	—	55	—	30,096
Southeastern Univ., Washington, D. C.	1917	James A. Bell	—	900	57	—	8,000
So. Calif. Univ. of, Los Angeles, Calif.	1879	R. B. von KleinSmid	—	16,739	795	1,600,000	260,000
Southern Illinois Normal University, Carbondale, Ill.	1874	Roscoe Pulliam	2,086	3,777	146	—	45,853
Southern Methodist Univ., Dallas, Texas	1911	Umphrey Lee	2,400	3,921	144	2,385,093	132,622
Southern Oregon College of Education, Ashland, Ore.	1926	Walter Redford	275	475	29	—	16,530
Southern St. Norm. Sch., Springfield, S. D.	1882	Wm. A. Thompson	296	416	21	120,000	14,000
So. Uni. & Agri. & Mech. Col., Scotlndvl., La.	1914	F. G. Clark	826	857	73	—	21,034
South, University of the, Sewanee, Tenn.	1857	Alexander Guerry	347	—	31	1,561,360	52,111
S. W. Tex. St. Tch. Col., San Marcos, Tex.	1903	C. E. Evans	1,441	1,850	61	—	44,000
Southwestern College, Memphis, Tenn.	1848	Charles E. Diehl	435	594	35	462,421	46,687
Southwestern College, Winfield, Kan.	1885	Frank E. Mossman	542	623	43	590,259	24,500
S. W. Col. Div. Occ., Weatherford, Okla.	1903	James B. Boren	1,000	—	60	—	28,927
Southwestern La. Inst., Lafayette, La.	1898	Lether E. Frazar	2,296	3,633	115	—	34,293
Southwestern Univ., Georgetown, Texas	1840	John W. Bergin	603	—	36	606,000	35,000
Spearfish Normal School, Spearfish, S. D.	1883	E. C. Woodburn	302	304	32	—	16,150
Spelman College, Atlanta, Ga.	1881	Florence M. Read	369	384	48	3,137,357	65,000
Spring Hill College, Spring Hill, Ala.	1830	Wm. D. O'Leary	359	496	38	170,000	36,600
Stanford Univ., Stanford University, Calif.	1885	Ray L. Wilbur	4,340	—	600	28,553,353	773,626
Stanstead Wesleyan Col., Stanstd., Que., Can.	1872	Errol C. Amaron	325	—	27	153,000	4,000
State Normal School, Farmington, Me.	1864	Lorey C. Day	325	625	32	—	10,000
Stephens College, Columbia, Mo.	1833	James M. Wood	1,725	—	225	122,025	30,000
Sterling College, Sterling, Kan.	1887	Hugh A. Kelsey	235	259	28	469,278	15,800
Stevens Inst. of Tech., Hoboken, N. J.	1870	Harvey N. Davis	620	1,088	76	—	30,000
Storer College, Harpers Ferry, W. Va.	1867	Henry T. McDonald	162	177	16	100,000	15,000
Stout Institute, The, Menomonie, Wis.	1893	Burton E. Nelson	604	604	45	—	22,405
Sue Bennett College, London, Ky.	1896	Kenneth C. East	195	206	15	—	9,000
Sullins College, Bristol, Va.	1870	Wm. E. Martin	410	—	40	146,000	10,000
Sul Ross State Tch. Col., Alpine, Tex.	1919	Horace W. Morelock	504	1,024	27	—	20,000
Susquehanna University, Selinsgrove, Pa.	1858	G. Morris Smith	349	359	36	410,788	17,372
Swarthmore College, Swarthmore, Pa.	1864	John Nason	760	766	101	7,749,215	119,980
Sweet Briar College, Sweet Briar, Va.	1901	Meta Glass	454	—	52	520,536	52,690
Syracuse Normal School, Syracuse, N. Y.	1924	William W. Wright	149	153	12	—	4,025
Syracuse University, Syracuse, N. Y.	1870	Wm. Pratt Graham	5,916	8,607	698	4,694,229	269,400
T							
Talladega College, Talladega, Ala.	1867	Buell G. Gallagher	278	—	29	1,000,000	20,000
Tarkio College, Tarkio, Mo.	1883	M. Earle Collins	216	243	24	659,000	16,621
Taylor University, Upland, Ind.	1846	Robt. Lee Stuart	325	—	24	307,368	16,655
Tch. Col., Athenaeum of O., Cincinnati, O.	1928	Carl J. Ryan	57	675	20	—	21,951
Temple University, Philadelphia, Pa.	1888	Charles E. Beury	5,141	11,073	806	107,698	192,080
Tenn. Agri. & Indus. St. Tch. Col., Nashvle.	1912	Wm. J. Hale	1,185	1,688	78	—	28,907
Tennessee Poly. Inst., Cookeville, Tenn.	1915	W. E. Derryberry	950	—	50	—	25,000
Tenn. State Tch. Col., Johnson City, Tenn.	1911	Chas. C. Sherrod	741	—	51	—	30,000
Tennessee State Tch. Col., Memphis, Tenn.	1909	Richard C. Jones	1,003	1,091	60	—	30,000
Tenn. State Tch. Col., Murfreesboro, Tenn.	1911	Q. M. Smith	750	824	52	—	30,000
Tennessee, Univ. of, Knoxville, Tenn.	1794	James D. Hoskins	3,460	5,455	230	487,013	169,468
Tex., Agri. & Mech. Col. of, Col. Station	1876	Thomas O. Walton	6,534	8,582	412	209,000	70,000
Texas Christian Univ., Fort Worth, Tex.	1873	Edward M. Waits	1,500	2,000	80	1,750,000	50,470
Texas College, Tyler, Texas	1894	D. R. Glass	540	924	40	—	8,000
Tex. Col. of Arts and Indus., Kingsville, Tex.	1925	J. O. Loftin	1,274	1,800	90	—	25,000
Tex. Col. of Mines and Metal., El Paso, Tex.	1914	Dossie M. Wiggins	1,077	—	65	—	25,000
Texas St. Col. for Women, Denton, Tex.	1903	Louis H. Hubbard	—	3,990	165	—	73,000
Texas Technological Col., Lubbock, Tex.	1925	Clifford B. Jones	3,797	5,597	194	—	40,713
Texas, University of, Austin, Tex.	1883	Homer Price Rainey	10,091	16,818	715	43,845,145	639,732
Texas Wesleyan College, Fort Worth, Tex.	1890	Law Sone	—	933	34	167,481	18,223
Tillotson College, Austin, Texas	1877	Mary E. Branch	350	361	27	—	17,007
Toledo, University of, Toledo, Ohio	1872	Philip C. Nash	1,815	3,116	159	—	100,000
Toronto Bible College, Toronto, Ont., Can.	1894	John McNicol	300	600	8	—	5,000
Toronto, University of, Toronto, Ont., Can.	1843	Henry J. Cody	6,109	7,811	1057	23,000,000	368,280
Tougaloo College, Tougaloo, Miss.	1869	Judson L. Cross	398	399	27	45,412	11,546
Transylvania College, Lexington, Ky.	1780	Raymond F. McLain	431	561	30	684,207	40,598
Trinity College, Burlington, Vt.	1925	Sister M. Emmanuel	60	110	14	—	10,000
Trinity College, Hartford, Conn.	1823	Remsen B. Ogilby	559	736	63	3,549,626	135,000
Trinity College, Sioux City, Ia.	1913	Edwin Leimkuhler	90	265	19	—	10,000
Trinity University, Toronto, Ontario, Canada	1851	F. H. Cosgrave	413	420	28	1,466,158	39,000
Trinity University, Waxahachie, Tex.	1869	F. L. Wear	270	314	29	695,8 6	20,579
Tri-State College, Angola, Ind.	1884	Burton Handy	1,200	—	40	—	7,000
Tufts College, Medford, Mass.	1852	Leonard Carmichael	2,188	—	418	7,559,151	190,000

Institution and Location	Year Founded	Chief Executive	Full Time Students	Full and Part Time Students	Faculty	Endowment	Library Volumes
Tulane University, New Orleans, La.	1834	Rufus C. Harris	2,981	2,035	557	$11,036,038	242,702
Tulsa, University of, Tulsa, Okla.	1894	C. I. Pontius	787	1,172	71	40,623	58,982
Tuskegee Inst., Tuskegee Institute, Ala.	1881	F. D. Patterson	1,280	2,155	141	7,005,046	54,952
U							
Union College, Barbourville, Ky.	1879	Conway Boatman	248	412	25	391,778	14,153
Union College, Lincoln, Neb.	1891	A. H. Rulkoetter	430	554	34	—	30,000
Union College, Schenectady, N. Y.	1795	Dixon Ryan Fox	770	787	78	4,479,782	110,000
Union University, Jackson, Tenn.	1834	John J. Hurt	425	655	29	321,000	14,000
U.S.Coast Guard Acad. New London, Conn.	1876	James Pine	261	—	35	—	14,781
U. S. Military Academy, West Point, N. Y.	1802	Jay L. Benedict	1,833	—	283	—	107,000
U. S. Naval Academy, Annapolis, Md.	1845	Wilson Brown	2,000	—	278	—	88,000
Upper Iowa University, Fayette, Iowa	1857	V. T. Smith	325	438	20	425,000	11,880
Upsala College, East Orange, N. J.	1893	E. B. Lawson	460	612	31	500,000	20,000
Ursinus College, Collegeville, Pa.	1869	Norman E. McClure	582	—	43	675,000	35,000
Ursuline College, Louisville, Ky.	1919	Mother M. Roberta	103	240	27	—	13,000
*Ursuline College, New Orleans, La.	1912	Mother Mary Bernard	146	150	22	—	14,489
Ursuline Col. for Women, Cleveland, Ohio	1871	Mother M. Concepta	181	—	31	—	17,000
Utah State Agri. Col., Logan, Utah	1888	Elmer G. Peterson	3,393	4,244	159	10,870	74,521
Utah, University of, Salt Lake City, Utah	1850	George Thomas	4,469	5,468	208	787,766	147,612
V							
Valparaiso University, Valparaiso, Ind.	1859	O. P. Kretzmann	384	457	37	550,555	43,372
Vanderbilt University, Nashville, Tenn.	1872	Oliver C. Carmichael	1,790	—	460	25,043,000	230,293
Vassar College, Poughkeepsie, N. Y.	1861	Henry N. MacCracken	1,239	1,241	187	10,668,996	224,400
Vermont State Norm. Sch., Castleton, Vt.	1867	Ermo Houston Scott	160	171	11	—	7,000
Vermont St. Norm. Sch., Johnson, Vt.	1867	D. W. McClelland	94	—	11	—	6,421
*Vermont St. Norm. Sch., Lyndon Center, Vt.	1921	Rita L. Bole	125	125	11	—	7,500
Vermont, University of, Burlington, Vt.	1791	Newman K. Chaffee	1,454	2,381	248	3,503,531	152,433
Victoria College, Victoria, B. C., Can.	1902	Percy H. Elliott	215	239	12	—	5,917
Victoria University, Toronto, Ont., Can.	1836	E. W. Wallace	930	1,003	42	3,046,853	90,000
Villanova College, Villanova, Pa.	1842	E. V. Stanford	974	2,731	122	—	50,110
Vincennes University, Vincennes, Ind.	1806	W. A. Davis	117	—	11	—	7,589
Virginia Intermont College, Bristol, Va.	1884	Hugh G. Noffsinger	440	500	35	246,459	8,498
Virginia Military Inst., Lexington, Va.	1839	C. E. Kilbourne	735	—	55	249,031	55,169
Va. Polytechnic Inst., Blacksburg, Va.	1872	Julian A. Burruss	3,980	4,025	297	349,312	88,622
Va. St. Col. for Negroes, Petersburg, Va.	1883	John M. Gandy	1,010	1,623	144	173,000	29,160
Virginia State Tch. Col., Farmville, Va.	1884	Joseph L. Jarman	914	1,361	53	—	29,792
Va. Theol. Sem. & Col., Lynchburg, Va.	1887	Wm. H. R. Powell	110	—	18	—	2,000
Virginia Union University, Richmond, Va.	1865	William J. Clark	644	904	72	877,454	31,380
Virginia, Univ. of, Charlottesville, Va.	1819	John L. Newcomb	3,015	—	414	11,512,570	338,535
W							
Wabash College, Crawfordsville, Ind.	1832	George V. Kendall	430	431	31	2,500,000	85,535
Wagner Mem.Luth.Col.Staten Island,N.Y.	1883	C. C. Stoughton	256	318	30	341,209	16,868
Wake Forest College, Wake Forest, N. C.	1834	Thurman D. Kitchin	1,082	1,632	80	2,300,000	60,065
Walla Walla College, College Place, Wash.	1892	George W. Bowers	612	732	35	—	17,034
Wartburg College, Waverly, Iowa	1868	E. J. Braulick	242	—	25	43,945	22,000
Washington & Jefferson Col.,Wash., Pa.	1780	Ralph C. Hutchison	555	637	38	1,547,592	57,415
Washington and Lee Univ., Lexington, Va.	1749	Francis P. Gaines	930	—	65	3,186,060	120,000
Washington College, Chestertown, Md.	1782	Gilbert W. Mead	317	—	28	35,000	22,319
Washington Miss. Col., Takoma Pk., D. C.	1904	Benj. G. Wilkinson	400	572	67	—	22,000
Washington, State Col. of, Pullman, Wash.	1890	Ernest O. Holland	4,311	5,114	245	4,580,589	440,000
Washington St. Norm.Sch.,Machias, Me.	1909	Philip H. Kimball	95	—	16	—	6,000
Washington University, St. Louis, Mo.	1853	George R. Throop	8,549	9,852	676	17,446,699	452,654
Washington, University of, Seattle, Wash.	1861	Lee Paul Sieg	10,014	13,564	558	635,000	451,805
Wayland College, Plainview, Texas	1909	George W. McDonald	225	235	11	15,000	5,500
Wayne University, Detroit, Mich.	1881	Frank Cody	4,702	10,385	744	—	126,259
Waynesburg College, Waynesburg, Pa.	1849	Paul R. Stewart	382	480	23	189,500	19,000
Weatherford College, Weatherford, Texas	1868	G. C. Boswell	378	466	19	72,000	11,681
Weber College, Ogden, Utah	1889	H. A. Dixon	991	1,051	61	—	17,000
Webster College, Webster Groves, Mo.	1915	George F. Donovan	175	402	40	—	18,184
Wellesley College, Wellesley, Mass.	1870	Mildred H. McAfee	—	1,509	199	10,535,562	189,000
Wells College, Aurora, N. Y.	1868	William E. Weld	272	273	46	1,471,085	90,500
*Wesleyan College, Macon, Ga.	1836	Dice R. Anderson	242	245	30	$ 382,918	23,102
Wesleyan University, Middletown, Conn.	1831	J. L. McConaughy	760	—	79	7,[illegible]	281,328
Wessington Sprgs. Col.,Wess. Sprgs., S. D.	1887	W. A. Harden	86	102	12	2,000	8,000
West Chester St. Tch.Col.,West Chester,Pa.	1871	Chas. S. Swope	1,550	2,150	84	-	34,000
Western Carolina Tch.Col.,Cullowhee,N.C.	1889	Hiram T. Hunter	495	—	45	—	14,854
Western College, Oxford, Ohio	1853	Ralph K. Hickok	305	—	40	910,021	41,040
Western Ill. St. Tch. Col., Macomb, Ill.	1899	Walter P. Morgan	927	2,401	81	—	50,000
West. Ky. St. Tch. Col., BowlingGreen,Ky.	1906	Paul L. Garrett	1,076	4,028	106	—	55,892
Western Maryland Col., Westminster, Md.	1867	Fred. G. Holloway	590	919	57	902,000	36,012
Western Reserve Univ., Cleveland, Ohio	1826	Winfred G. Leutner	3,392	11,752	714	14,[illegible],107	520,000
West. St. Col. of Colo., Gunnison, Colo.	1911	Chas. C. Casey	704	784	32	—	29,000
Western St. Tch. Col., Kalamazoo, Mich.	1904	Paul V. Sangren	2,412	3,704	213	—	51,552
Western Union College, LeMars, Iowa	1900	David O. Kime	272	410	24	157,055	12,000
Westfield State Teachers College, Westfield, Mass.	1839	Edward J. Scanlon	115	—	26	—	15,000
West Liberty St Tch.Col.,W.Liberty,W.Va.	1838	Paul N. Elbin	282	732	24	—	17,040
Westminster College, Fulton, Mo.	1851	Franc L. McCluer	301	—	22	750,000	28,000
Westminster Col., New Wilmington, Pa.	1852	R. F. Galbreath	681	695	50	592,200	22,000
Westminster Col., Salt Lake City, Utah	1875	Robert D. Steele	180	222	22	150,000	14,500
*Westminster College, Tehuacana, Texas	1895	Clarence A. Sutton	135	140	10	25,000	6,000
West Texas St. Tch. Col., Canyon, Tex.	1910	J. A. Hill	975	1,983	83	—	47,185
West Virginia State Col., Institute, W. Va.	1891	John W. Davis	1,004	1,383	45	—	22,000
West Virginia Univ., Morgantown, W. Va.	1867	Charles E. Lawall	2,090	4,167	272	—	206,913
West. Wash. Col. of Edu., Bellingham,Wash.	1899	W. W. Haggard	830	884	68	—	60,824
Wheaton College, Norton, Mass.	1834	J. Edgar Park	405	—	71	1,186,353	47,833
Wheaton College, Wheaton, Ill.	1860	V. R. Edman	1,043	1,096	78	670,000	54,000
Whitman College, Walla Walla, Wash.	1859	W. A. Bratton	579	586	42	1,131,250	70,609
Whittier College, Whittier, Calif.	1901	W. O. Mendenhall	549	862	56	702,009	43,000
Whitworth College, Spokane, Wash.	1890	Frank F. Warren	200	—	27	—	10,000
Wichita, Municipal Univ. of, Wichita, Kan.	1926	William M. Jardine	1,512	3,135	105	101,797	57,000
Wiley College, Marshall, Texas	1873	Matthew W. Dogan	443	662	42	601,000	17,000
Willamette University, Salem, Ore.	1842	Bruce R. Baxter	775	805	47	1,700,000	550,000
William and Mary, Col.of,Williamsburg,Va.	1693	John Stewart Bryan	1,200	1,785	110	1,321,983	235,282
Wm. Jennings Bryan Univ., Dayton, Tenn.	1925	Judson A. Rudd	75	76	10	—	30,000
William Jewell Col., Liberty, Mo.	1849	John F. Herget	444	—	27	1,250,000	45,000
Williams College, Williamstown, Mass.	1793	James P. Baxter	835	—	96	11,000,000	176,000
William Woods College, Fulton, Mo.	1890	Henry G. Harmon	284	289	34	680,000	11,053
Willimantic State Teachers College, Willimantic, Conn.	1889	George H. Shafer	175	300	15	—	30,000
Wilmington College, Wilmington, Ohio	1870	S. Arthur Watson	250	577	26	325,000	17,000
Wilson College, Chambersburg, Pa.	1869	Paul Swain Havens	380	—	50	817,845	45,000
Winona State Teachers Col., Winona, Minn.	1858	O. Myking Mehus	521	—	50	—	22,000
Winthrop College, Rock Hill, S. C.	1886	Shelton Phelps	1,812	2,392	109	—	52,876
Wisconsin State Tch. Col., Eau Claire, Wis.	1916	Harvey A. Schofield	687	1,116	42	—	26,000
Wisconsin St. Tch. Col., Milwaukee, Wis.	1880	Frank E. Baker	1,480	2,632	93	—	51,163
Wisconsin State Tch. Col., Oshkosh, Wis.	1871	Forrest R. Polk	781	962	52	—	27,317
Wisconsin State Tch. Col., Platteville, Wis.	1866	Asa M. Royce	581	1,088	40	—	28,000
Wisconsin State Tch. Col., Superior, Wis.	1896	Jim Dan Hill	749	769	59	—	35,000
Wisconsin St. Tch. Col., Whitewater, Wis.	1868	Claude M. Yoder	894	1,505	55	—	34,000
Wisconsin, University of, Madison, Wis.	1849	Clarence A. Dykstra	12,134	16,090	600	—	1,100,000
Wittenberg College, Springfield, Ohio	1845	Rees E. Tulloss	810	1,350	75	2,059,966	62,623
Wofford College, Spartanburg, S. C.	1851	Henry N. Snyder	478	508	29	792,386	36,000
Woodstock College, Woodstock, Md.	1869	David Nugent	246	—	30	—	110,000
Wooster, College of, Wooster, Ohio	1866	Charles F. Wishart	917	984	75	3,600,000	88,828
Worcester Poly. Inst., Worcester, Mass.	1865	Wat T. Cluverius	638	666	75	4,164,129	27,000
Wycliffe College, Toronto, Ont., Can.	1879	Henry Hague Davis	52	—	8	—	5,000
Wyoming, University of, Laramie, Wyo.	1887	Arthur G. Crane	3,102	—	170	2,834,977	106,642
X							
Xavier University, Cincinnati, Ohio	1831	Celestine J. Steiner	564	1,490	67	—	76,442
Y							
Yale University, New Haven, Conn.	1701	Charles Seymour	5,349	—	555	106,925,700	2,150,000
Yankton College, Yankton, S. D.	1881	J. L. McCorison, Jr.	328	421	38	750,000	31,000
Yeshiva College, New York, N. Y.	1928	Bernard Revel	221	227	44	—	30,500
York College, York, Neb.	1890	D. E. Weidler	215	223	22	90,000	14,990
Youngstown College, Youngstown, Ohio	1908	Howard W. Jones	767	1,813	75	—	17,850

University Professors, American Association of: *see* ACADEMIC FREEDOM.

Untermyer, Samuel (1858–1940), U.S. lawyer, was born in Lynchburg, Va., March 2, and died in Palm Springs, Calif., March 16. For a biographical sketch see *Encyclopædia Britannica,* vol. 22, p. 882.

Unwin, Sir Raymond (1863–1940), English town planner, was born in Oxford, November 2 and was graduated from Magdalen College school, Oxford. He studied engineering and architecture and practised from 1896 as an architect. He planned Letchworth, the first garden city in England and several other model cities. He was lecturer on town planning at Birmingham university from 1911 to 1914 and in the latter year was made chief town planning inspector of the local government board. During the World War of 1914–18 he was director of the housing branch of the ministry of munitions and after the war became chief architect of the ministry of health. He was appointed visiting professor of architecture at Columbia university in 1936. In 1937 he received the Royal Gold medal for distinction in architecture. He died in Lyme, Conn., June 28.

Urology. A new sulphonamide derivative, 2 thiazole (p-aminobenzenesulphonamide), or sulphathiazole, was added recently to the rapidly increasing list of therapeutic agents employed by the urologist. Apparently little doubt exists that sulphathiazole will prove to be one of the most effective members of the entire sulphonamide group. In the treatment of gonorrhoea, indications are that the drug may prove to be the most valuable agent. Sulphathiazole compares favourably with other members of the sulphonamide group in the treatment of infection in the urinary tract, and for uncomplicated infection with staphylococci, it appears to be specific. The large amounts of sulphathiazole found in the urine, as compared with sulphanilamide and sulphapyridine, and its intensification by passage through the body, suggest that it will be a more valuable urinary antiseptic than either of the latter. Although some cases have been reported in which haematuria and deposit of crystals followed its use, sulphathiazole usually is tolerated well and apparently is less toxic than other members of the group; however, the same care and observation of patients under treatment with sulphathiazole must be carried out as of patients under treatment with other sulphonamide derivatives. These drugs are dangerous if prescribed or used by those untrained in their use and none of the treatments referred to is to be employed except under the direction of a physician.

There has been continued interest in the problem of hypertension and unilateral renal disease. This problem presents a definite challenge to the urologist and has resulted in a plea for more careful study of disease of the kidneys as a possible cause of hypertension. Experimental research and clinical investigation have established relationship between non-nephritic renal lesions and hypertension and have given better understanding of the mechanisms involved. Hypertension in the presence of unilateral renal lesions has in some instances been relieved by surgical operations on the kidney. Although relief of hypertension was reported in some cases subsequent to conservative operation, it occurs most often after nephrectomy. Atrophic pyelonephritis, which occurs most often in association with hypertension, is the renal lesion that responds most readily to surgical treatment. This condition is unilateral and is characterized by extensive atrophy of the renal tissue, with sclerosis of the renal blood vessels. Although these pathologic changes usually are present, the underlying mechanism which causes the hypertension is not fully understood. Not in every case does the finding of a unilateral renal lesion in the presence of hypertension indicate that operation is advisable, for other conditions may be present which contraindicate surgical intervention. Finally, in evaluating the result of surgical operation on the kidney for hypertension, it is important that follow-up examinations of the patient be made over a period of at least a year to determine whether or not the improvement or apparent cure is permanent. Many cases were reported in which return of blood pressure to normal was only temporary. The problem is complex. An important fact which studies of histogenesis and morphology in different stages of pyelonephritis have made clear is that the clinical importance of pyelonephritis has been underestimated.

Recently, increased emphasis was placed on the role of calcium metabolism in the pathogenesis and treatment of stones in the urinary tract and on the importance of studying quantitatively the calcium excreted in the urine. The work accomplished in these respects appears to be a definite contribution to the prophylaxis and medical management of urinary calculi. This newer knowledge is especially valuable in prophylaxis against urinary calculi when there is augmented excretion of calcium in the urine. Preliminary studies show that when an increase in urinary calcium is present, acid-ash diets and vitamin D should be given with care; on the other hand, in cases of normal urinary calcium, benefit may be expected from the use of acid-ash diets and vitamin D. Moreover, in a consideration of recurrence of stone in a particular kidney, the possibility that urinary calcium is altered through that kidney is of importance.

The problem of treatment for stag-horn calculi, unilateral or bilateral, has always been difficult. Attention is called to the efficacy of timely surgical intervention to save the kidney, and emphasis is placed on the fact that if operation is performed early the risk is low. In addition to removal of the stones, correction of any pathologic change which may have occurred at the ureteropelvic juncture or in the lower part of the ureter is important.

The therapeutic management of diverticula of the bladder has long been a subject of much interest and is worthy of mention. In a large majority of cases thorough transurethral resection of the vesical neck will relieve the obstruction and will obviate the risk, discomfort and prolonged hospitalization incidental to diverticulectomy. If surgical removal of the diverticulum becomes necessary, it can be accomplished without great difficulty.

The effect of sex hormones in the treatment of enlarged prostate gland was the subject of clinical investigation in recent years. Injection of the male hormone produces a temporary depletion of spermatozoa, and attention is called to the fact that its promiscuous use over a long period of time may be harmful to normal testicular function. Although some observers have reported reduction in size of the enlarged prostate gland after administration of the male hormone, permanent improvement of the bladder function does not usually occur. Recent reports following the use of the female hormone (di-ethyl-stilb-esterol) in the treatment of prostatic obstruction would indicate definite reduction in the size of the enlarged prostate gland and functional improvement in some cases. It remains to be seen, however, whether both the reduction in the size of the prostate gland and the amelioration of obstructive symptoms will be permanent.

Evidence collected thus far gives little support to the theory that malignant tumours of the bladder can be cured by roentgen therapy of supervoltage.

Cystometry again commanded the attention of urologists and increased interest in the physiology of micturition. Most important in this field is the trend to standardize nomenclature in cystometry and to establish broad, basic principles in classification of cystometrograms in both normal and pathologic states of the bladder. (*See* also CHEMOTHERAPY.)

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Uruguay, a republic on the Atlantic coast of South America, between Brazil and Argentina; language, Spanish; president, General Alfredo Baldomir; area, 72,153 square miles. The population (1933 census: 1,993,234) was officially estimated at 2,132,888 in 1939. The percentage of whites is higher than in any other American country except Argentina and Canada. The chief cities are: Montevideo (capital), 684,036; Paysandú, 50,000; Salto, 48,000; Mercedes, 24,900; Fray Bentos, 18,000.

History.—Throughout 1940 Uruguay was torn by issues arising from European war developments. At the beginning of the year serious difficulties were experienced in handling interned German sailors from the auxiliary ship "Tacoma." As early as February, President Baldomir made strenuous efforts to further defences, but an apathetic congress rejected compulsory military service and other proposals. In June, baring of widespread fifth-column activities and pro-nazi plots to overthrow the government aroused great excitement which was calmed only by Brazilian loan of arms and munitions, the arrival of two United States cruisers and formal pledges by the United States minister of United States aid. Following these disclosures, conscription was enacted into law without serious opposition, and attention was given to suppression of fifth-columnism, although with but partial success.

Late in the year the paramount issue was the proposed granting to the United States of naval base rights at Punta del Este, on the Atlantic coast, as part of the hemisphere defence program. In the face of strong Argentine protest and bitter opposition within his own cabinet, some of whose members resigned, as well as in congress, President Baldomir pushed the project, but no definite plans had been made public by the end of the year. Meanwhile, on Dec. 14, after several days of conference at Colonia with the

Argentine foreign minister, Foreign Minister Guani announced an Argentine-Uruguayan agreement to co-operate in defence of the Río de la Plata area against non-American aggression.

In December, when the British auxiliary cruiser "Carnarvon Castle" visited Montevideo for repairs after an engagement with a German war vessel, leading newspapers advocated abandonment of neutrality and granting of unrestricted use of Uruguayan waters to British warships patrolling the south Atlantic.

Education.—Education is free and compulsory. There are 1,648 primary schools (1938 enrolment: 209,651). The National university, at Montevideo, has approximately 10,000 students.

Defence.—Uruguay has an army of 7,916, and other armed forces of 5,400. An air squadron of 45 planes is being expanded, as is the small naval force.

Finance.—The monetary unit is the peso (value: approx. 36 cents U.S.). The public debt was 398,084,266 pesos on Dec. 31, 1939.

Communications.—External communication is principally by water. Regular, frequent air service is maintained with Argentina, with three weekly flights by Pan American Airways to Brazil and northward. In July 1940 the latter service was improved and time from Montevideo to New York shortened to less than 48 hours. There are over 22,500 mi. of highways of all classes, and 1,683 mi. of railway. In 1940, 7,861,000 pesos were appropriated for highway development and extension during 1941, and 1,900,000 pesos for completion of a railroad already under construction to the Brazilian border.

Trade.—During 1939 and 1940 Uruguayan foreign trade suffered materially from imminence of war and actual war in Europe. In 1939, British, German and French purchases declined respectively 25·7%, 45·7% and 46%, while United States purchases increased 266·9% from an abnormal low in 1938. Exports in 1939 were valued at 101,366,303 pesos, a 5·2% increase, with livestock products comprising over 75%. Great Britain took 18·5% (1938: 26·1%); the United States, 13·9% (1938: 4%); Germany, 12·1% (1938: 23·5%); Brazil and Italy, 6% each (1938: 3·6% and 4·4%); France, 3·8% (1938: 7·4%). Imports (textiles, foodstuffs, fuel oil and miscellaneous manufactured goods) were 65,364,003 pesos, largely from Great Britain, 18·3% (1938: 19·8%); Germany, 16·4% (1938: 16·8%); Brazil, 8·6% (1938: 7·7%); and Japan, 2·7% (1938: 4·7%). In the first nine months of 1940 exports were 76,682,000 pesos (a 3·9% drop), imports 50,255,000 pesos (a 3% increase), with 15·9% to the United States, and 11·9% from that country. Chilled meat exports rose 9% in that period, due to heavy British purchases which averaged 4,000 tons monthly.

Production.—Cattle-breeding and sheep-raising are the chief industries, and nearly 80% of the land is in grazing. The chief agricultural products are wheat, linseed, maize and oats. Processing and packing of meat products is an important industry. (*See* also ARGENTINA; HISPANIC AMERICA AND THE EUROPEAN WAR.)

(L. W. BE.)

U.S.S.R.: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Utah, a Rocky Mountain state, admitted to the United States in 1896, is popularly known as the "Mormon State": area, 84,990 sq.mi.; population in 1940, 550,310. In 1930 there were 495,955 native whites, 1,108 Negroes and 10,784 persons of other races, including 4,012 Mexicans, 3,269 Japanese and 158 Filipinos. Salt Lake City, the capital, had a population of 149,934 in 1940. Other cities: Ogden, railway centre (1940) 43,688; Provo, seat of Brigham Young university (1940), 18,071; Logan, 11,868.

History.—Mormon population of the capital is estimated at 40% and that of the rural districts at 60%. The Mormon social security program has attracted national interest. In the 1940 presidential election, Nov. 5, 1940, Roosevelt received 154,277 votes; Willkie 93,151; Thomas 198 and Browder 191. The veteran United States Senator William H. King, conservative Democrat, failed to receive renomination and his seat went to Representative Abe Murdock. Walter K. Granger was sent to congress from the 1st district and Representative J. W. Robinson was returned by the 2nd district.

Herbert B. Maw, liberal Democrat, attorney, educator and former president of the state senate, was elected governor by a plurality of 10,806 votes over Don B. Colton (R). The new governor was preparing to offer the overwhelmingly Democratic legislature a progressive program including sweeping reforms in state government with a view toward efficiency and economy, and development of the state's natural resources. The legislature will also consider the report of a citizens' committee recommending reorganization of the administration of higher education. Composition of the legislature: senate, Democrats, 19; Republicans, 4; house, Democrats, 44; Republicans, 16. In 1940 E. E. Monson was secretary of state; Reese M. Reese, auditor; Oliver G. Ellis, treasurer; Grover A. Giles, attorney-general; and Charles H. Skidmore, superintendent of public instruction.

HERBERT B. MAW, Democrat, elected governor of Utah Nov. 5, 1940

Education.—The University of Utah, Salt Lake City, had in 1940 an enrolment of 4,315, the Utah State Agricultural college, Logan, 3,229, and Brigham Young university 2,782. With an enrolment of 137,434 students and a force of 4,607 teachers and principals and 1,000 other employees, the cost of elementary education was as follows: operating cost, $9,754,606.30; capital outlay and debt service, $3,510,482.48.

Defence, Agriculture, Manufacturing, Mining.—With $36,599,370 authorized for defence expenditures in Utah, the state became a vital link in national defence. Major construction projects included Utah General depot, Hill field, Ogden Ordnance depot, Fifth Air base and Fort Douglas, Wendover Bombing range and Salt Lake Reception centre. Ft. Douglas was an important air base with 2,600 men and 260 officers. In the production of gold, silver, copper, lead and zinc, valued at $86,440,325, Utah in 1940 led all western states. Manufacturing gains have been pronounced since 1933, and the last six months showed the largest employment and pay rolls of any given year, with products estimated around $210,000,000. New enterprises during the last decade included oil refineries, textile mills, mining machinery, potato alcohol and dairy products. The United States bureau of mines erected a $300,000 experiment station in Salt Lake City. With farm cash income totalling $50,000,000, Utah farmers enjoyed the highest returns in a decade. The year 1940 brought additional irrigation development. Conservation facilities built or nearing completion had a combined capacity of 264,000 acre feet.

(F. W. GA.)

Utilities: *see* PUBLIC UTILITIES.

Uzbek S.S.R.: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Vanadium. Required as a constituent in certain types of high grade alloy steels and cast irons, vanadium is produced in considerable quantities. World production in 1939 was about 3,000 metric tons, of which Peru furnished 34%, United States 30%, South West Africa 17%, Northern Rhodesia 13% and Mexico 5%. There is a growing demand for vanadium catalysts in the production of sulphuric acid and certain organic compounds, as well as in the ceramic and dyeing industries. (*See* also RADIUM.) (G. A. RO.)

Varnishes: *see* PAINTS AND VARNISHES.

Vassar College, Poughkeepsie, New York, completed its 75th year of instruction in June, 1940. The date was made the occasion of a celebration. The 75th anniversary series of publications, comprising more than 20 scholarly works in art, music, literature, biography and other fields, by members of the faculty and graduates of the college, has been published in honour of the 25th year of President Henry Noble MacCracken. The anniversary itself on the 8th, 9th and 10th of June was attended by over 3,000 graduates. The addresses and reports were published in July by the *Vassar Alumnae Magazine*. In honour of the event a fund of $2,000,000 for the endowment of scholarships and educational expenses was planned. The campaign opened October 20 and more than $1,950,000 was subscribed. Fifty thousand dollars additional were given for a housing project for members of the faculty. Greetings from alumnae in every part of the United States and from the 400 graduates resident in foreign countries were received. Many exhibitions of the work of Vassar graduates were given. The endowment of a graduate department of conservation, through the application of the sciences of zoology, botany, geology and psychology, was announced.

Jane North Baldwin House, a new 35-bed infirmary with the latest equipment, was opened in May. A new glass laboratory for the department of botany was completed in September, as was a sound-film studio for research in child development, a gift of the General Education board. (H. N. MACC.)

Vatican City State. A sovereign and completely independent domain, representing the temporal power of the pope. It was established in 1929, through the Lateran treaty between the Holy See and Italy. Adjacent to Rome and completely encircled by Italian territory, it covers only 108·7 acres. Within this small area are located the basilica of St. Peter, palace of the pope, Vatican library, museums, gardens and smaller edifices. Recognized as part of the papal domain and enjoying extra-territorial rights are 13 buildings in Rome and the villa at Castel Gandolfo. The population was in 1940 reduced to 750, consisting of ecclesiastical officials, guards, clerks and servants.

The pope, in his function of temporal ruler, exercises complete legislative, executive and juridical rights over Vatican City state. Three cardinals are commissioned to take charge of administrative matters. Papal gendarmes, numbering about 100, perform police duties, and the famous Swiss, Palatine and Noble guards assist at state functions and palace routine. Being a completely independent government, the Vatican City state has its own postage, coinage, flag, and has an internationally recognized diplomatic representation. Within its confines, all the affairs, spiritual and temporal, of the Roman Catholic Church as a world power are transacted. Upon the entrance of Italy into the war, the Vatican City state offered residence to diplomats and officials of nations at war with Italy. Vatican City citizenship was conferred on Italians serving in papal nunciatures and delegations accredited to countries hostile to Italy. The American, English, Scotch and many other ecclesiastical colleges were closed. The semi-official daily, the *Osservatore Romano,* after reaching in 1939 a circulation of more than 200,000, fell to 10,000, following the Italian ban placed on it. It continued to speak strongly on international matters, condemning the invasion of Luxembourg, Holland, Belgium, etc., correcting the distortions of the Italian press on the peace speech by the pope in November, etc. The Vatican radio station, likewise, freely broadcast news, for example, about the conditions in Poland, and made efforts to locate refugees and to reunite families separated by the war. (*See* also PIUS XII.) (F. X. T.)

Vegetable Oils and Animal Fats. Edible oils and fats developed in 1940 into the most vulnerable point in the wartime food situation of Europe, owing to the prevention of imports of vegetable oils, oilseeds and fats by blockade. Europe normally imports about one-third of its vegetable oils and fats from overseas. The average annual consumption, as estimated by the U.S. department of agriculture, was 5,700,000 metric tons, of which 1,840,000 metric tons were imported. Europe's average pre-war consumption of such oils and fats was divided into 2,850,000 metric tons of vegetable oils from oilseeds, 1,400,000 metric tons of butter of which Europe produces an export surplus, 1,120,000 metric tons of lard, and 330,000 metric tons of marine oils, all utilized chiefly in oleomargarine and cooking fats. In Germany, where the shortage of oils and fats was especially acute, seizure of Danish and Netherlands butter stocks helped temporarily to fill what is known as the "fat gap." Some further relief in the fat shortage was developed in Germany by introducing soybean bread into the army ration. Chemists discovered methods of eliminating the bitter taste from soybean flour, which has a high fat content, and which could be increased by soybean imports from Danube countries. (*See* SOYBEANS.) A large part of the dairy cattle feeds in Germany, Denmark, the Netherlands and Belgium is dependent on imported oilseed cake, the oilseeds being shipped in (such as cottonseed), the oil extracted and the residue fed to livestock. Absence of such imports in 1940 compelled the slaughter of many cattle and further reduced the source of fat supplies, particularly butter. The war also practically stopped the operations of Norwegian and German whaling ships, which were a source of supplies of marine oils for oleomargarine and cooking fats. Data on food production and stocks are considered military secrets in a number of countries and such information is often unobtainable or of doubtful authenticity. For conservation purposes Italy pooled olive oil stocks and it was announced that 1940 production was about 300,000 short tons. Since the ten-year average of olive oil production in Italy is only 222,400 short tons, the 1940 estimate may be considered at least highly optimistic, particularly in the light of comparable Spanish production. Spain forbade olive oil exports in 1940 because of a shortage in production, estimated at 297,000 short tons, compared with 352,000 short tons in 1939 and a five-year average of 453,200 short tons. (For comparable data on oils, fats, sugar, bread grains and other food in Europe see "A Review of the Food and Feed Situation in Continental Europe," *Foreign Crops and Markets,* vol. 41, no. 14, Oct. 14, 1940, U.S. department of agriculture.) In the Americas and in tropic countries wartime restrictions resulted in large accumulations of oil foods and feeds, particularly coco-nut, cottonseed and pork products. (S. O. R.)

Vegetables: *see* CORN; LETTUCE; POTATOES; SWEET POTATOES; TOMATOES; TRUCK FARMING; MARKET GARDENING; ETC.

Venereal Diseases. The end of the year 1940 in the national venereal disease control pro-

gram found every state health department in the United States organized for the control of syphilis in the civilian population and ready to assist in protecting men concentrated in military areas against venereal diseases. Federal funds totalling $8,080,000 made available in 1939 and 1940 under the Venereal Disease Control act, plus approximately $10,300,000 from state and local sources, enabled health authorities to put into operation machinery for the control of the venereal diseases.

The expansion of activities is demonstrated in the annual reports of state health departments from 1937 through 1940. The table shows the number of syphilis cases reported to state health departments, the serologic tests performed for the detection of the disease, the doses of arsenical drugs distributed by health departments and the number of venereal disease clinics in operation.

Syphilis Cases Reported to State Health Departments, 1937–40

Fiscal Year	Syphilis Cases	Serologic Tests	Doses of Arsphenamine	Clinics Operating
1937	336,258	2,618,159	1,567,348	1,380*
1938	480,140	3,598,198	2,799,110	1,746
1939	485,967	5,588,285	4,677,285	2,405
1940	487,464	10,216,978	6,895,837	2,887

*Estimated, these data being unavailable.

The growth of the organization for case-finding is shown in the annual increase in number of blood tests for syphilis. While the syphilis cases reported remained fairly constant following the intensive case-finding program of 1937 and 1938, the reported amount of arsphenamine distributed increased more than 300% from 1937 to 1940. The doubling of the number of clinics during the same period is significant of the attempt to make diagnostic and treatment facilities accessible to all sections of the population. Solution of this problem has advanced to the point where mobile clinics go to the patients in eight rural areas of the south and southeast. Trailers with complete medical equipment cover as much as 500 mi. and hold as many as 24 clinic sessions in one week.

The clinics' need of a fast, accurate accounting system to determine the treatment status of their patients has been met in more than 1,000 of them by a mechanical reporting system. Twelve central tabulating units covering over 200,000 cases in 25 areas provide clinic directors with current morbidity reports and a means of rapidly selecting individual patients in need of special care.

Efforts to prepare standard treatment procedures and to evaluate new drugs and techniques for the treatment of the venereal diseases continued.

The treatment for syphilis known as the "five-day" or "intravenous drip" method, which has been under investigation for several years at Mt. Sinai hospital in New York city, was being tried out at several additional treatment sources in 1940. The hope offered by this massive dosage through constant dripping of the drug into the blood stream is a shortening of the treatment period which under the standard method of administering smaller divided doses of arsenicals continues 18 to 24 months. A technique in which as much of an arsenical is administered in five days as usually is given over a three-month period would be of particular value in shortening the infectious period of early syphilis. This method of treatment was still in the experimental stage, however, in 1940, and long observation will be needed before conclusions on the value of the five-day treatment can be reached.

A study of the relative effectiveness of artificial fever mechanically induced compared with the older method of clinically induced malaria fever in the treatment of paresis was made by clinics co-operating with the United States public health service. Investigators determined that both types of fever treatment combined with chemotherapy secured good results, the proportion of remissions being dependent on the degree of impairment at the beginning of fever therapy.

At the beginning of the national program, health authorities concentrated on syphilis control because they lacked an effective weapon for conducting a mass attack on gonorrhoea. With the introduction of the sulphonamide compounds for the treatment of this disease, activities directed toward the control of gonorrhoea were being pushed forward. Probably no drug has become so universally used by the general practitioner in so short a time as sulphanilamide and its derivatives. The tablets distributed by health departments increased from 3,500,000 to 6,000,000 since 1938. Studies undertaken jointly by the United States public health service and the American Neisserian Medical society show that the period of communicability of gonorrhoea is considerably shortened by the use of the sulphonamide compounds.

Among other activities continued in 1940 were public education and the seeking of state legislation related to venereal disease prevention. An indication of the educational activity in printed, motion picture, radio and graphic information was the 1,500,000 published pieces on venereal diseases sold in the fiscal year of 1940 by the government printing office to public and private health agencies and to individuals. Questionnaires to determine how much the public has learned about venereal disease control have been filled out by more than 40,000 persons.

Twenty-four states have enacted laws requiring blood tests for syphilis of all applicants for marriage licences, and the legislatures of several others are expected to consider similar action in their 1941 sessions.

The great national task of 1940 was the initiation of rearmament. While such agencies as the American Medical association, the U.S. army and navy medical corps and the U.S. public health service joined in a movement to co-ordinate medical services and to bring about health preparedness, venereal disease control officials in these and other groups formulated plans to meet the threat of the venereal diseases to the military and industrial forces of the nation. Records show that the venereal diseases were the third greatest cause of days lost in the U.S. army during the World War of 1914–18, being surpassed only by influenza and battle casualties.

Health authorities agreed on a co-operative venereal disease control policy for military and key industrial areas. The Wisconsin state board of health with federal, military and local co-operation gave an example of what could be done in walling off civilian venereal disease contacts surrounding military camps. Policing to prevent "camp-follower" trailers, itinerant amusement places and prostitutes from coming into a 1,000-sq.mi. area during the Aug. 1940 war games of the 6th corps area produced a phenomenally low rate of infection among the troops. Of 59,750 soldiers only 78 were admitted for venereal disease treatment and only four cases (all gonorrhoea) were traceable to infections within the area.

Probably the greatest single step in venereal disease defence activity was the regulation adopted by the national selective service board requiring serologic tests for syphilis on all men, 21 to 35 years old, as they appear before their local draft boards. State and local health authorities made laboratory facilities available for making these tests. The significance of the regulation may be understood from statistics showing that 80% of early infectious syphilis is concentrated in the 15–30 age group. (*See* also CHEMOTHERAPY.)

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Venezuela, a federal republic in northern South America; language, Spanish; capital, Caracas; president, General Eleazar López Contreras. The area is 393,976 sq.mi.; the population by the 1936 census was 3,467,839, including 103,492 Indians. The principal cities, with their 1936 populations are: Caracas, 203,432 (1940 estimate: 260,000); Maracaibo, 110,010; Valencia, 49,214; Barquisimeto, 36,429; Nirgua, 30,706; Carúpano, 30,163; Maracay, 29,759; Río Caribe, 29,696; Boconó, 25,315; Ciudad Bolívar, 25,134; Puerto Cabello, 22,213; San Cristóbal, 21,874; Cabimas, 21,753; Cumaná, 21,623; La Victoria, 21,372. La Guaira, port of Caracas, has a population of 9,717.

History.—During 1940, Venezuela continued politically orderly and stable. The municipal and state elections of November gave heavy majorities to President López Contreras' "Bolivarian party." Municipal councillors and state legislators jointly elect the national congress and political interest centred about that body's selection of a successor to López Contreras in the forthcoming presidential elections of April, 1941.

Economically the country was under some strain in the latter part of the year, due to European war effects upon her foreign markets, particularly in the Netherlands and the Scandinavian countries. Exports, especially of petroleum, suffered a sharp decline. In October, after the bolívar had sagged in international exchange from an approximate 31 cents (in terms of the U.S. dollar), maintained from 1933 to July of 1940, to 25 cents, the government established an Import Control commission, restricting and licensing imports. Even at the new figure the bolívar was higher in dollar terms than in 1932.

Education.—Primary education is compulsory and under control of the federal government. There are over 6,000 primary schools, 50% more than in 1938, with around 250,000 pupils, 11 normal schools, 51 public and 24 private secondary schools and two national universities (at Caracas and Mérida). Preparations were under way in 1940 for an industrial university at Maracaibo.

Trade and Communication.—In normal times Venezuela enjoys unusually extensive external steamship communications, but these were materially curtailed by European war conditions. The leading ports are La Guaira and Maracaibo, although several oth-

ers are important. External air communication was improved, however, during 1940, as the Pan American Airways increased its service from Central and North America and the East Coast of South America. The Royal Dutch Airways connects Caracas with Curaçao, while internal communication is maintained by a government-sponsored line.

There are 563 mi. of commercial railway and a 6,000-mi. highway network. These are supplemented by some 6,500 mi. of navigable rivers, especially in the Orinoco basin, where transportation is largely fluvial.

The main telegraph (7,886 mi.) and telephone (600 mi.) systems are government-owned. Since 1934 the number of telephones has increased 90%. There are 24 long-wave and 27 short-wave broadcasting stations, all but one being government-operated.

In 1939 exports totalled $297,917,389 (a 7·4% increase over 1938), imports $101,484,944 (a 4·4% increase). Curaçao took approximately 74% of exports (entirely petroleum), the United States 14%. The latter supplied 57% of imports. Imports are chiefly machinery, textiles and foodstuffs. In the first half of 1940 imports increased by 7%. Petroleum comprises around 90% of all exports (88% in 1939), but since practically all oil properties are in foreign hands, only an estimated 20% of all exports actually accrues to the country. Coffee provides from a third to one half of other exports (4% in 1939). Heavy reduction in petroleum exports in the second half of 1940 seriously threatened the national economy.

Production.—Venezuela is normally the world's third largest petroleum producer, accounting for nearly 10% of all production. In 1939, 208,070,000 bbl. were produced (1940 est.: 189,210,000 bbl.). Coffee, second export commodity, has been seriously affected by the European war. Government loans to assist growers to carry the crop were necessary in 1940. The Inter-American Coffee Quota agreement of Nov., 1940, however, gave promise of at least a stabilized market. Under it Venezuela was allotted 420,000 bags for export to the United States, 2½ times the actual 1938 total.

Finance.—The monetary unit is the bolivar (value: 25 cents U.S.). The national debt is less than 3,000,000 bolivares (2,648,968 in 1938), all of it internal, and is probably the smallest per capita in the world. In 1939 treasury receipts approximated 350,000,000 bolivares, expenditures 380,000,000.

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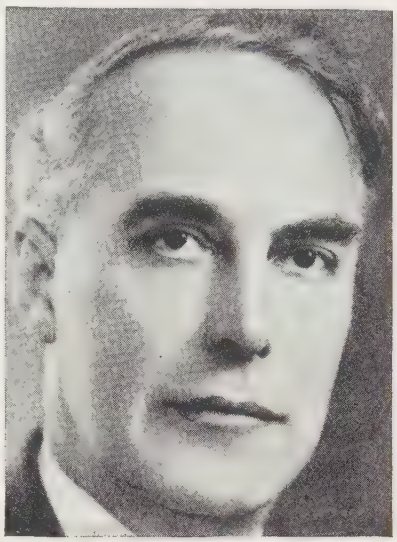
Verdier, Jean (1864–1940), French cardinal and archbishop of Paris, was born in Lacroix-Barrez, France, in Feb. 1864. He was educated in the Sulpician schools and colleges and was ordained priest in 1887. He was a professor for 40 years in the Sulpician seminary in Paris; in 1929 was elected superior general of the Sulpician order, and on Nov. 19 was appointed archbishop of Paris. Less than a month later he was made a cardinal. He visited the United States in 1923 and again in 1932. He actively supported the Allies after war broke out in 1939 and insisted they were "struggling for the freedom of people throughout the world." He died in Paris, April 9.

Vermont, fourteenth state of the United States, a north Atlantic state, first to be added to original thirteen, popularly known as the "Green Mountain State"; area, 9,564 sq.mi.; population, according to 1940 census figures, 359,231. This was 380, or one-tenth of 1%, less than the 1930 count. The urban population increased 3·8%, the rural declined 2%. Most of the urban gain was in the small cities, at the expense of the rural areas and larger cities. Of the state's three cities of over 10,000 population only Burlington gained, showing an increase from 24,789 to 27,686. Eight counties lost population, Caledonia showing the largest loss; and six gained, Chittenden showing the largest increase.

History.—A total presidential vote of 143,044 was cast in the state: Willkie 78,371; Roosevelt 64,269. William H. Wills was elected governor; Warren R. Austin and George D. Aiken, U.S. senators; Charles A. Plumley, representative to congress; Mortimer R. Proctor, lieutenant-governor; Thomas H. Cave, state treasurer; Rawson C. Myrick, secretary of state.

Education.—The public school system of the state is under the supervision of a state commissioner of education and local union superintendents, the revenues being derived mainly from state and local taxes. School interests advocated an increase in the minimum base pay of rural school teachers, a gradual increase from $15 to $20 per equated pupil in state support of schools, a $10,000 increase in the appropriation for vocational education. There are six colleges and universities in the state, three junior colleges, two state normal schools and a state agricultural school.



WILLIAM H. WILLS, Republican, elected governor of Vermont Nov. 5, 1940

Charities and Correction.—The charitable and corrective institutions consist of a state prison and women's reformatory, industrial school, two hospitals for the insane, a school for feeble-minded and a home for children. Erection of a state sanatorium with a capacity of 150 patients in connection with one of the state hospitals for the insane was recommended to the 1941 legislature. Building and improvement needs, totalling $500,000, at the state prison were also being agitated.

Finances.—The state treasury reported state finances to be in excellent condition. The state planning board survey reports indebtedness of Vermont cities, towns and incorporated districts increased only $262,351.01 between 1932 and 1938, compared with a sharp $8,810,458.71 jump in the previous 12-year period between 1920 and 1932. The state tax department reported receipts during 1940 of $806,129.20 from the state income tax to be a record-breaking total, exceeding the 1939 total by $87,622.46 and the previous peak, reached in 1938, by $47,636.56. Motor vehicle fees also reached a new high during the year.

Industries.—The industries of the state raised their production level during 1939–40. Employment tax returns from 15 representative industries indicated that the number of their employees has increased about 51% since 1938 and salaries paid have increased about 89%. The increase from 1939 to 1940 was larger than from 1938 to 1939. In the recreation field winter sport activities were still expanding. State officials estimated that $500,000 were invested by public and private agencies in new winter sports developments for the 1940–41 season. For statistics *see* also ALFALFA; APPLES; BARLEY; BEANS, DRY; BUCKWHEAT; CORN; FARM MACHINERY; GRAPES; HAY; MAPLE SUGAR; OATS; PEARS; POTATOES. (L. W. D.)

Veterans' Administration. The summation in Table I shows the number of veterans

Table I.—*U.S. Veterans and Dependents Receiving Benefits, June 30, 1940*

War	Living Veterans	Deceased Veterans	Total
War of 1812		1	1
Mexican		130	130
Indian	2,216	4,055	6,271
Civil	2,381	50,141	52,522
Spanish-American			
Service connected	1,584	1,325	2,909
Non-service connected	157,559	56,337	213,896
Special acts	87	58	145
Total Spanish-American	159,230	57,720	216,950
World War (War Time)			
Service connected	348,164	99,479	447,643
Non-service connected	60,296	17,524	77,820
Total World War	408,460	117,003	525,463
Regular establishment	36,051	10,126	46,177
Grand total	608,338	239,176	847,514

and deceased veterans whose dependents were receiving pension or compensation benefits as of June 30, 1940.

Hospital and Domiciliary Care.—As of June 30, 1940, 56,841 beneficiaries were receiving hospital care and 16,518 were receiving domiciliary care authorized by the Veterans' administration.

Of the number under hospital care, 4,703 were receiving treatment for tubercular ailments, 33,041 for neuropsychiatric diseases, 19,097 for general medical and surgical conditions.

Of those under domiciliary care, 304 were being treated for tubercular ailments, 4,753 for neuropsychiatric diseases and 11,461 for general medical and surgical conditions.

Table II.—*Fiduciaries Under Supervision, by Types, June 30, 1940*

	Incompetents		Minors	Total
	Veterans	Others		
Fiduciaries acting for wards of all wars:				
Guardianship for	38,375	4,396	16,639	59,410
Legal custodians for	43	81	9,397	9,521
Institutional awards	597	..	..	597
Total	39,015	4,477	26,036	69,528
Wards of all Wars	39,015	4,477	40,284	83,776

Insurance.—As of June 30, 1940, benefits provided for under term and automatic insurance were being paid in monthly instalments to 10,944 permanently and totally disabled veterans and to the beneficiaries of 12,258 deceased veterans. The disbursements for the above benefits during the fiscal year 1940 approximated $19,601,577.

As of June 30, 1940, there were 608,923 United States government life insurance policies in force, having a face value of $2,564,984,223.

As of the above date, monthly payments were being made, from the United States government life insurance fund, to 10,622 permanently and totally disabled veterans.

Table III.—*Total Disbursements to June 30, 1940*

Compensation and pensions:	
World War	$ 4,093,677,706.20
All other wars	9,851,330,412.67
Regular establishment	186,674,145.90
Payment to participants in yellow fever experiments	163,613.75*
Military and naval insurance	2,147,001,479.67
U.S. government life insurance	448,191,523.77
Adjusted service certificates	3,749,112,741.40†
Adjusted service and dependent pay	54,667,708.63
Loans to veterans for transportation	76,103.36
Hospital and domiciliary facilities and service (Constr.)	115,606,205.25
Vocational training	644,880,710.28
Allotments and allowances	582,941,081.16
Marine and seamen's insurance	35,078,013.20
Salaries and expenses (general administration)	2,055,244,831.79
Administrative expenses, Adjusted Compensation Payment Act, 1936	3,695,743.02
Printing and binding	2,225,327.69
National Industrial Recovery Act. V.A. 1933–39	3,018,704.79
Public Works Administration Act of 1938 (Allotment to V.A.) 1938–1940	12,014,254.28
Horatio Ward fund	21,742.33
General Post fund	1,716,100.52
Funds due incompetent beneficiaries	693,814.32
Personal funds of patients, V.A.	10,182,446.89
Miscellaneous	1,067,035.10
Total	$23,999,282,045.97

* Disbursements from June 30, 1931, to June 30, 1940.

† This amount represents payments made on adjusted service certificates and amounts reimbursed to the U.S. government life insurance fund on account of loans made from that fund on certificates under the provisions of the World War Adjusted Compensation act as amended, and the Adjusted Compensation Payment Act, 1936.

Emergency Officers' Retirement Pay.—As of June 30, 1940, there were 1,784 emergency officers receiving retirement pay for disabilities incurred during the World War. The annual disbursement for this form of benefit during the fiscal year 1940 approximated $2,936,259.

Guardianship.—The Veterans' administration, in order to safeguard all monies paid by the government in the form of pensions and compensation to incompetent or minor beneficiaries, maintains a close supervision of all guardianship activities.

The summation in Table II shows the number of fiduciaries under supervision as of June 30, 1940, subdivided by types of beneficiaries.

Disbursements.—Table III does not include loans made to veterans secured by U.S. government life insurance policies.

The total amount includes $1,251,263,333.79 made available by deduction for allotment from the pay of World War veterans while in service, from amounts collected as premiums on the various forms of government insurance, and amounts in other trust funds. (*See* also ADJUSTED COMPENSATION.) (F. T. HI.)

Veterans of Foreign Wars.

The fiscal year of the Veterans of Foreign Wars of the United States, ending Sept. 1, 1940, featured marked progress in its legislative, veteran welfare and Americanism programs.

During the year 1939–40, and for the ensuing year, the activities of the Veterans of Foreign Wars of the United States have been rededicated to the achievement of three principal objectives. These were outlined by Commander-in-chief Otis N. Brown, Greensboro, N.C., in his keynote speech to the 1940 national encampment, as follows:

"First, a national defence structure that will enable the United States to surround the western hemisphere with an insurmountable wall of protection against invasion either from the east or the west; second, a constant program of patriotic education that will expose the evil ambitions of subversive groups within our population and give greater emphasis to the blessings we enjoy as citizens under a government that exists for the benefit of the people; third, encouragement of those social, political or economic reforms that may be necessary to strengthen our democracy, to make it more efficient and more capable of dealing with conditions which create poverty, discontent and disloyalty."

"One Nation Indivisible" was the theme upon which virtually every phase of the V.F.W. program was based during the 12 months. This principle, in the words of the oath of allegiance to the American flag, dominated the 41st annual national encampment August 25–30, at Los Angeles, Calif. It was the guiding motif of local V.F.W. programs on patriotic occasions and it was the basis of the intensive Americanism and national defence activities sponsored by local posts throughout the country. As an educational feature of its Americanism program, the V.F.W. promoted the display of approximately 12,000 24-sheet billboard posters on signboards in every state, proclaiming "foreign 'isms' can't divide Americans—united we stand!—one nation indivisible with liberty and justice for all."

As an example of its educational activities in support of Americanism, the Veterans of Foreign Wars of the U.S., in co-operation with its ladies' auxiliary, sponsored a nationwide essay contest for high school students during 1939–40 on the subject "The Benefits of Democracy." More than 100,000 students submitted essays in competition for $2,000 in cash prizes. The first prize of $1,000 in cash was awarded to 17-year-old Sam Cooper, Omaha high school senior, son of an immigrant.

The year also marked enactment, by the national congress, of a number of major veteran welfare laws instituted or supported by the V.F.W. One of these was the so-called Philippine Travel Pay bill providing for the payment of certain emoluments to Spanish-American War veterans owed them by the government since 1900. Another increased the pensions of approximately 30,000 World War widows whose husbands died of service-connected

disabilities, from approximately $30 to approximately $40 a month each. Another liberalization of veteran laws was embodied in a veterans' administration ruling providing that total disability ratings may henceforth be applied to many cases not previously allowable.

Concerning its own part in the nation's defence plans, the V.F.W. has volunteered its entire membership, individually and collectively, for service whenever and wherever needed. Its members are particularly qualified for service in home defence units, in training younger men for military service and to serve on conscription boards. The V.F.W. also, as a result of a mandate of its Los Angeles convention, inaugurated a plan by which national defence committees would be organized in each V.F.W. state department for the purpose of intensifying co-operation with constituted authorities in all national defence activities and preparations.

Officers elected for 1940–41 include Dr. Joseph C. Menendez, New Orleans, La., commander-in-chief; Max Singer, Brighton, Mass., senior vice commander-in-chief; Robert T. Merrill, Havre, Mont., junior vice commander-in-chief; R. B. Handy, Jr., Kansas City, Mo., adjutant-quartermaster general; John L. Sullivan, Phoenix, Ariz., judge advocate general; Dr. William D. Ryan, Detroit, Mich., surgeon general; the Rev. E. F. Austin, Richmond, Calif., national chaplain; Carl J. Schoeninger, Detroit, Mich., inspector general; R. E. Kernodle, Kansas City, Mo., national historian. (B. Y.)

Veterinary Medicine.

A fatal disease of foxes and minks manifested by tonic spasms of the voluntary muscular system was shown to be a vitamin-B_1 deficiency by the researches of R. G. Green, M.D., professor of bacteriology, medical school, University of Minnesota, and his associates, Dr. C. A. Evans and W. E. Carlson. The disease was named Chastek paralysis, for the Minnesota fox ranch on which the discovery was made. Its nature had baffled the most capable investigators for years. It occurs mainly during the late winter months and invariably follows the feeding of uncooked fish as part of the ration on fox farms. Carp, quillbacks, Atlantic coast whiting and several other species of fish have caused serious outbreaks of the disease. Chastek paralysis can be experimentally produced with precision by feeding a diet containing whole, uncooked fish, and it can be prevented or corrected with equal precision by giving adequate doses of thiamin hydrochloride or by feeding a ration rich in vitamin B_1.

Although Chastek paralysis appeared to be an avitaminosis, since infectious factors were ruled out by examination and experimental study, the results of experimental feeding were puzzling on account of their irregularity, until it was discovered that direct contact with the ground often gave the animals opportunity to obtain something that prevented the deficiency. With foxes in raised, wire pens, it was determined that each pound of fresh carp required about 2,000 units of crystalline vitamin B_1 added to the diet.

Vaccinating Hogs against Cholera.—The popular method of vaccinating swine against cholera discovered by Dorset, Niles and McBryde shortly after the turn of the century was replaced to a certain extent by the use of a chemically modified virus developed by Wm. H. Boynton in the research laboratory of the University of California.

The new vaccine confers immunity without producing the depressing reaction following the standard method and overcomes the spreading of the disease by vaccinated hogs. The immunity conferred by the Dorset-Niles-McBryde method is solid and durable, but because it requires the use of a highly-virulent virus, the discovery of a harmless virus of equal immunizing value aroused the interest of veterinarians and swine breeders, some of whom discarded the old method during 1940.

Brucellosis of Cattle.—This insidious disease of cattle, commonly called contagious abortion or Bang's disease, occupied more than usual attention in 1940 due to a mitigation in the controversial matter of applying certain control measures in combating the disease. The "test and slaughter" method, popularly recognized and universally employed as the medium of bovine tuberculosis eradication in the United States and Canada, was applied in 1934 as a means of removing an apparent surplus in dairy cows and has been conducted since as a step toward a more complete control of the malady. During the same period, studies have been in progress on a rather large scale for the purpose of determining the potential possibilities of a comparatively safe method of preventive vaccination with a viable vaccine developed from a low virulent culture of the Brucella organism in the laboratories of the bureau of animal industry. Analogous tests of this material were also carried out in the University of California in addition to studies in other similar institutions and by many other research workers. The encouraging and favourable results reported created an enthusiastic eagerness among those directly connected with the industry in the hope that an adjunct had been discovered which would permit control of the disease in instances where the destructive features of the slaughter plan are less applicable to the situation. That portion of the industry whose herds had been freed of the disease and who were in constant fear that the disease might again strike with devastating effect were also focusing attention on vaccinal developments.

Rabies.—At the annual meeting of the American Veterinary Medical association compulsory vaccination of dogs was disapproved, pending a more general agreement as to its immunizing value. Single-dose vaccination of dogs with commercial rabies vaccine was recommended when used concurrently with other control measures, particularly the systematic disposal of stray dogs, isolation and quarantine.

Swine Erysipelas.—The spread of swine erysipelas over wider areas has caused anxiety among swine breeders in recent years. Its importance in swine production, meat packing and public health was discussed at length in a symposium on the subject held in connection with the 77th annual meeting of the American Veterinary Medical association at Washington, D.C. Although the disease in man is generally a somewhat benign local infection contracted in the handling of meat and fish, it is a depressing and often fatal disease in swine that is capable of causing great losses where enzootic outbreaks occur.

The septicaemic or European type of the disease, formerly rare in the United States, has become more prevalent in recent years and was in 1940 regarded as a threat to the swine-breeding industry.

Preventive vaccination by means of living cultures of the specific microorganism injected simultaneously with hyperimmune serum has not been approved by the bureau of animal industry on account of the possible danger of spreading the infection when used in the absence of professional supervision, although experiments in the field with this method of vaccination were in progress in 1940. Only the use of antiserum, which confers but transient passive immunity and has limited curative value, was permitted in 1940.

Phenothiazine.—Among the noteworthy developments of 1940 was the discovery of the remarkable benefits derived from the use of phenothiazine in the treatment of farm animals parasitized with intestinal worms. Extensive experiments conducted under the direction of the U.S. bureau of animal industry since 1938 and its use on a large scale in horses, cattle, sheep and swine have established the unusual anthelmintic property of this chemical and its relative harmlessness which are the two properties representing the ultimate objective of animal helminthology. Although phenothiazine was discovered in 1885 and its destructive action against the larvae of certain insects was known since 1934, its value as a remedy for intestinal worms in farm animals became known in 1940. As worm parasites of the stomach and intestines are extremely harmful in animal production and the remedies previously available are toxic, the discovery of a drug that expels worms from the alimentary tract without inflicting any damage to the host is exceedingly important in the practice of veterinary medicine. Facts as to its therapeutic merits and its remarkable safety were proved on the large swine-breeding farms of the United States and in the vast sheep herds of Australia.

In addition to meeting the specifications of a true anthelmintic, the low price conforms to the economics of livestock production. Worthy of note is the proved but unexplained fact that phenothiazine is of no value as a vermifuge in carnivorous animals.

Poultry Practice.—A remarkable increase in the application of scientific poultry medicine appears to mark 1940 as the starting point of long-delayed reforms in the prevention and treatment of the four or five deadly contagious diseases which have curtailed poultry and egg production. In round numbers the poultry of the United States is valued at $1,000,000,000, from which 25% was marked off annually on account of losses from diseases that are largely preventable. The World's Poultry congress of 1938 which drew an attendance of 850,000 to Cleveland, O., devoted a day to the discussion of the disease problems responsible for these tremendous losses. Neglect of poultry medicine by the members of the veterinary profession engaged in rural practice, and the habitual tendency of poultrymen to depend upon nostrums of little medicinal value as a consequence, was ably emphasized by Professor Emeritus James E. Rice, Cornell university.

Biological Products for Animals.—A notable event of 1940 was the renaming of many of the biological products employed in the preventive treatment and diagnosis of animal diseases. As of June 30, 1940, the United States bureau of animal industry, which is charged with the granting of licences for such products, published in Notice 162–A the nomenclature that would thereafter be accepted. The object was to avoid the use of deceptive names for products that are not specific for a given disease and to remove inferior ones from the channels of trade. Only definitely specific agents may now be named for the disease for which they are employed. "Rabies vaccine," "tetanus antitoxin," etc., are examples of approved names. Such vague terms as "calf scours serum," "abortion vaccine," and many others were abolished and the products renamed for precisely what they contain.

About 90 different biologic products were in use in 1940 and many of them were stored in large quantities throughout the country to meet current emergencies. Permission was granted to dispose of many of these biologics under their old names until Dec. 31, 1940.

Meat and Milk Inspection.—The removal of unwholesome meat, milk and poultry from the channels of trade ranked among the important projects of the veterinary service. Although a large percentage of animals and animal products destined for human use is inspected by the federal government and careful tradesmen look for the stamp of approval on market meat, local abattoirs may sell uninspected meat within the state. Trucking and improved highways can invite wide distribution of unfit meat and meat products. As a consequence, states and municipalities were in 1940 installing veterinary services to supervise the slaughtering of animals not federally inspected.

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Vicalloy: *see* METALLURGY; TELEPHONE.

Vichy. A town of central France, department of Allier, on the right bank of the Allier, 33 mi. southeast of Moulins; population (1939) about 20,000. Vichy was known primarily as a medicinal spa until the summer of 1940, when it became the temporary capital of the French government, which was unable to return to Paris because of the German occupation. Vichy was in the unoccupied part of France, and one reason for its selection as a seat of government was that it possessed a considerable number of hotels which could be requisitioned and reserved for the use of government officials. The French government which was established in Vichy was headed by Marshal Henri Philippe Pétain as chief of state.

The waters of Vichy were known in the days of the Romans and their fame was revived in the latter part of the 17th century. The waters, which are limited, have an alkaline taste and are recommended for diseases of the stomach and the liver, especially for diabetes and gout. "Vichy" is one of the best known French mineral waters, and considerable quantities are bottled and exported. The town was one of the most fashionable and popular French health resorts and was provided with a casino, a park and many luxurious hotels. (W. H. CH.)

Victoria. A state of the Australian commonwealth, area 87,844 sq.mi.; pop. (est. Dec. 31, 1939), 1,887,278. Chief towns (pop. Dec. 31, 1939): Melbourne (1,046,750); Geelong (40,100); Ballarat (38,590); Bendigo (30,150). Governor, Maj. Gen. Sir W. J. Duggan, K.C.M.G., C.B., D.S.O.

History.—Mr. Dunstan's government, the first Country party administration in Australian history, was returned at the general election which was held in March 1940. The only change in the respective strength of the parties was that the United Australia party opposition lost two seats, one to labour and one to an independent. The government continued in office, supported by the Labour party, the largest single party in the legislative assembly. At the legislative council elections held in June only 8 of the 17 provinces were contested.

The state accounts for 1939–40 disclosed a surplus of £6,000 and were largely in accord with budget estimates. The budget for 1940–41 provided for an estimated surplus of £3,000. No new taxation was imposed and a reduction of the unemployment relief tax by 15% was announced.

Consequent upon the speed-up in armament production and the construction of new munition factories, business was buoyant. Seasonal agricultural and pastoral prospects were fair.

Dr. W. R. N. Maloney, M.P., one of the most popular figures in the political and medical life of Australia, died on Aug. 29, 1940. He had enjoyed a parliamentary career of more than 50 years and had represented Melbourne in the federal parliament since 1904.

Finance.—In 1938–39: Revenue £A26,986,000; expenditure £A27,773,000; debt outstanding (June 30, 1939) £A179,698,118.

Communications.—Roads and streets fit for motor traffic (Sept. 30, 1938) 104,004 mi. Railways (1938–39) 4,767 mi. Motor vehicles licensed (1938–39): cars, trucks, etc., 234,719; cycles 26,698. Wireless receiving set licences (Dec. 31, 1939) 339,652. Telephones (June 30, 1939) 208,230.

Agriculture, Manufactures, Mineral Production.—Production in 1939–40: wheat 45,055,000 bu.; wool 165,829,182 lb.; coal, brown (1939) 3,651,014 tons; gold (1939) 156,522 fine oz. Industry and labour, 1939–40: factories 9,250; employees 201,831; gross value of output £A152,967,611; unemployment (trade union returns) (June 1940), 6·6%. (W. D. MA.)

Vinylite: *see* FASHION AND DRESS; INDUSTRIAL RESEARCH; PLASTICS INDUSTRY.

Vinyon: *see* INDUSTRIAL RESEARCH; RAYON; TEXTILE INDUSTRY.

Virginia, the most southerly of the middle Atlantic group of states and one of the original states of the United States, popularly known as "The Old Dominion"; first settled permanently in 1607; area 42,627 sq.mi.; population according to 1940 U.S. census, 2,677,773, which is 10% larger than in 1930; capital, Richmond, 193,042; and seaport, Norfolk, 144,332.

History.—James H. Price was governor in 1940; Saxon W. Holt, lieutenant governor, died in 1940. The 1940 general assembly passed a constructive group of measures increasing appropriations for public education and welfare, bringing the Unemployment Compensation act in conformity with recent federal legislation, establishing premarital examinations, providing a comprehensive mining code, and taking steps toward eliminating pollution in Hampton Roads and Potomac river areas. Bills introduced at this assembly to integrate Virginia's penal system, to make probation effective and provide for parole of felons, to place county sheriffs and city sergeants on salaries, to encourage mediation and conciliation of labour disputes, to establish a state personnel system and to create an actuarially sound retirement plan for teachers were not passed.

In the 1940 national election Virginia gave Roosevelt 235,961 votes, Willkie 109,363. Harry F. Byrd was returned to the senate; all nine Democratic candidates were elected to the house of representatives.

Education.—The 1940 census recorded 712,081 children between seven and 19, inclusive, for whom Virginia has a free school system which is compulsory for all between seven and 15 years. Physical training is obligatory; whites and Negroes have separate schools. Public school membership was 593,231 in the 1939–40 session for which total disbursements, including capital outlay of $5,366,567.31 and debt service of $2,398,203.65, were $31,466,398.68.

Public Welfare and Health.—Total state expenditures on public welfare for year ending June 30, 1940 were $8,968,123.14, 9·65% of total state expenditures. About 11% of population, 292,795, were registered for relief or welfare service. The state spent $1,301,415.53 on penal institutions; $272,820.52 on industrial schools; $2,572,799.79 on mental institutions and $4,821,087.30 on non-institutional activities—public assistance, confederate pensions and criminal expenses. State, federal and local funds for public assistance in Virginia amounted to $4,262,641.98, including cost of administration.

At the close of the 1939–40 fiscal year, 18,192 were receiving old-age assistance. For the same period 29 rural health departments served 45 counties having 62% of Virginia's rural population. State expenditures on public health were $2,338,158.98, 2·52% of total state expenditures.

Banking and Finance.—Jan. 1, 1940, Virginia had 185 licensed state banks and 130 national banks. Total assets of state banks, $289,184,000; of national banks, $438,434,000; combined total assets, $727,618,000. Combined liabilities of state and national banks included aggregate deposits, $635,325,000; capital stock, $44,581,000; surplus, $26,852,000; undivided profits, $10,044,000. June 30, 1940 cash balance in state treasury, $10,696,415.73; unobligated surplus, $3,713,645.59; gross bonded debt, $19,515,732.02; assets in sinking fund, $4,755,363.41; net debt, $14,760,368.61; no floating debt. Revenues and expenditures for fiscal year 1939–40 were $96,234,587.88 and $92,939,671.77, respectively.

Agriculture and Manufacturing.—Estimated 1940 total farm income was 5% higher than 1939. Total value of crops increased 4%, estimated at $101,017,000 in 1940 as compared with $97,123,000 in 1939. There were 3,791,000 ac. of principal crops harvested. Corn, the leading crop both in acreage and value, had an estimated yield of 26·5 bu. per acre, the highest on record. Forecast of crops and their value, Dec. 23, 1940: bales: cotton, 25,000, $1,118,000; bushels: apples (commercial), 10,325,000, $6,711,000; barley, 2,376,000, $1,331,000; buckwheat, 195,000, $146,000; corn, 36,490,000, $28,097,000; cowpeas, 100,000, $150,000; oats, 1,932,000, $927,000; peaches, 1,392,000, $1,392,000; pears, 525,000, $289,000; potatoes, 10,412,000, $6,351,000; rye, 576,000, $420,000; soybeans, 480,000, $408,000; sweet potatoes, 3,875,000, $2,906,000; wheat, 8,463,000, $7,278,000; pounds: peanuts, 196,800,000, $6,691,000; tobacco, 97,540,000, $15,048,000; tons: tame hay, 1,252,000, $15,149,000. There were 126,530 ac. devoted to truck crops valued at $10,001,000. In 1939, 2,444 manufacturing plants reported to the department of labor and industry; their total wages, $152,217,950, were paid to 175,592 persons, the average number of wage earners; cost of their materials was $629,111,530; and the value of their products, $1,101,351,198.

(J. S. Br.)

Virginia, University of. A state institution for higher education situated at Charlottesville, Va. The original university was designed and built by Thomas Jefferson. There are six departments; two academic—the college and department of graduate studies; and four professional—law, medicine, engineering and education. The institution has a productive endowment fund amounting to $11,512,570, and received from the state an annual appropriation of $847,795 (1939–40). The total budget for 1940–41 was $2,930,443. The corporate name of the university is "The Rector and Visitors of the University of Virginia." In 1940 the faculty and officers numbered 414 (professors and instructors); the students 3,015 (119 women; 2,896 men). Number of books in the library, 338,535.

(J. L. N.)

Virgin Islands, a United States West Indian dependency east of Puerto Rico, comprising St. Croix, St. Thomas, St. John and smaller islands; language, English; capital, Charlotte Amalie (on St. Thomas); acting governor, Dr. Robert Morss Lovett. The area is 133 sq.mi. Government is administered by a governor appointed by the president of the United States, with legislative functions vested in the municipal councils of St. Croix and St. Thomas.

Provisional figures on the 1940 census, released late in the year, indicated an increase in population of the islands for the first time since their acquisition by the United States in 1917. In contrast to a 16% decline between 1917 and 1930, population rose 13·1% to 24,889. The white population, a third of which is alien-born, continued in substantially the same proportion as before (9%), but the proportion of Negroes (78·3% in 1930) dropped to 69%, as "mixed and other races" jumped from 12·5% to 22%. The chief cities are: Charlotte Amalie, 9,801 (7,036 in 1930); Christiansted, 4,495 (3,767 in 1930); and Fredriksted, 2,498 (2,698 in 1930).

History.—The outstanding feature in Virgin Islands history during 1940 was its increasing importance as a major link in United States Caribbean defences. Work was begun on a submarine base adjacent to Charlotte Amalie, while a new air base was planned for St. Croix. On Nov. 26 Lawrence W. Cramer, governor since 1935, resigned. In December considerable attention was focused upon efforts to open the islands, without restriction of United States immigration quotas, as a haven for financially independent European political refugees. The proposal was still under discussion as the year closed.

External communication is by steamer and Pan American Airways. In 1940 suspension of a British shipping line formerly serving the islands cut direct communication with New York city.

Agriculture.—In 1939 imports totalled $2,487,805, and comprised manufactured goods, foodstuffs and fuel oil. The last, coming almost entirely from Curaçao and Venezuela, aggregated 20% of all imports. Around 60% of imports is of United States origin. Exports were $1,558,523 in 1939, almost entirely to the United States. Rum (46·1%) and sugar (20%) were the principal export items.

Sugar production, the principal industry, is restricted to a quota of 8,916 tons.

Education.—In 1940 there were 26 public and private schools, with a total enrolment of 4,719 in 1939. In 1940, 13·4% of the inhabitants over 10 years of age were illiterate (16·1% in 1930). The ratio among Negroes was 14·8%; whites, 12·6%; others, 9·2%.

Finance.—The monetary unit is the United States dollar. A United States government subsidy to assist in defraying operating expenses is made annually.

(L. W. Be.)

Virus: *see* Bacteriology; Cold, Common; Infantile Paralysis.

Vital Statistics: *see* Birth Statistics; Death Statistics; Infant Mortality; Marriage and Divorce; Suicide Statistics; Census, 1940.

Vitamins. Until recently riboflavin was considered a dietary essential only by reason of analogy. Evidence of the importance of this factor was derived almost entirely from laboratory experiments with animals. Later it was found that people whose diet lacked sufficient milk or meat, the two most important food sources of this factor, exhibit a condition of undernutrition which is curable with riboflavin. In 1938 the symptomatology and treatment of an entirely new disease called ariboflavinosis was described. Patients with this condition exhibit a typical fissure in each angle of the mouth. The lips have a reddened and denuded appearance. There frequently is a dermatitis about the nose, occasionally elsewhere on the body. It was reported in 1940 that certain conditions in the eye frequently occur in patients with riboflavin deficiency. Kruse, Sydenstricker, Sebrell and Cleckley examined patients with a slit lamp and found evidence of a vascularizing keratitis associated with photophobia, dimness of vision and other symptoms. Rapid improvement followed the administration of from 5 to 15 mg. of riboflavin daily. The observation that pathologic changes in the eye may occur in riboflavin deficiency suggested to the authors not only that some of the cases of keratitis of unknown origin may be successfully treated with riboflavin, but also that deficiency of this vitamin may be more widespread than it was supposed. In this connection Spies and his collaborators reported that riboflavin deficiency is so common in some areas of the southern part of the United States as to partake of the nature of an endemic disease. In evidence offered in support of a suggested minimum requirement for riboflavin of 2 mg. (obtainable in about one quart of milk), the opinion was expressed that riboflavin deficiency probably is more widespread than deficiency of any other vitamin in the human diet.

Williams and his collaborators at the Mayo Clinic, Rochester, Minn., reported further interesting observations of thiamin deficiency in man. Patients in an insane asylum were maintained under careful medical supervision on diets low in thiamin. There developed in these patients symptoms of weakness, lack of appetite and loss of enthusiasm, comprising in general a condition such as might be diagnosed as neurasthenia. There was no

peripheral neuritis, a fact which tends to confirm Mikeljohn's view that thiamin is concerned only with the oxidation of carbohydrate. These patients were considerably improved following the administration of small amounts of thiamin hydrochloride daily and further improvement occurred when the dosage was increased. From these results it was suggested that previous standard allowances for vitamin B_1 in the diet, usually from 300 to 400 international units daily, may be too low for optimum health.

Interest in the practical aspects of the vitamins in nutrition was intensified. The United States Food and Drug administration published in the *Federal Register* for Sept. 5, 1940, certain proposals for the labelling of vitamin-containing foods with the aim of enabling purchasers to use commercial products more intelligently. In another connection the suggestion was made that some processed foods such as white flour could well be improved by the addition of the essential vitamins and minerals found in whole grains. The council on foods and nutrition of the American Medical association approved of this proposal as a step in the interests of public health. White flour contains about 0.2 mg. of thiamin, 0.18 mg. of riboflavin and 3.7 mg. of nicotinic acid to the pound. The wheat from which the flour was made contains about 2 mg. of thiamin, 1.1 mg. of riboflavin, and 12 mg. of nicotinic acid. White bread contains from about 50 to 100 international units of thiamin to the pound loaf; whole wheat bread, 450 or more. Because cereals contribute so largely to the diet, upwards of 25% of the total calories consumed, it is evident that improvements in the nutritional quality of processed cereal foods should, if the program is properly carried out, redound to the benefit of the public. In Great Britain the program of improving white flour had already begun by 1940 and was discussed by Moran and Drummond and by numerous writers in the *Lancet, Nature,* and the *British Medical Journal.*

Among the numerous contributions to the growing knowledge of the vitamin B complex may be mentioned the announcement by Williams and Major of the chemical structure of a derivative of pantothenic acid and its synthesis. Pantothenic acid was produced by coupling the derivative α-hydroxy-β, β-dimethyl-γ-butyrolactone with β-alanine. This vitamin was shown to be capable of preventing or curing a type of dermatitis in chicks. The rat fed on rations deficient in pantothenic acid develops adrenal necrosis with haemorrhages in the cortex. This observation, together with the report by Morgan that young silver foxes placed on a ration lacking the anti-gray hair factor exhibited survival of the thymus, which had a red and mottled appearance, emphasizes that some of the vitamins may be inter-related with the endocrine systems of the body. Work on the vitamin B complex was progressing so rapidly that it is only by careful and persistent study of the scientific and medical literature that even an expert can keep up with the field. Reviews such as that of Lepkovsky are invaluable sources of technical information. An excellent summary of information about nutritional diseases in the United States, with particular reference to the vitamins, was contributed by Sebrell. Reports on the value of administrations of vitamin K to the mother, even a few hours before the birth of her child, in preventing intracranial haemorrhage of the newborn, were corroborated. On the other hand further studies on the uses of alpha-tocopherol in the treatment of muscular dystrophy or amyotrophic lateral sclerosis were not encouraging. Newer data on the vitamin content of foods were becoming available as methods for the estimation of the vitamins improved. Booher and Hartzler reported their determinations of the vitamin B_1 content of foods in terms of crystalline thiamin. They rate peanuts and pork as the richest sources among the common foods. Munsell has summarized many of the data in the literature on the content of vitamins A, B_1, C, D and riboflavin in many foods. Elvehjem reviewed some of the evidence regarding the nicotinic acid content of foods. Melnick and Field likewise reported many data on the nicotinic acid content of foods as measured by chemical methods. (*See* also ALIMENTARY SYSTEM, DISORDERS OF; BIOCHEMISTRY; CHEMISTRY, APPLIED; CHEMOTHERAPY; DENTISTRY: *Vitamins;* DERMATOLOGY; DIETETICS; EYE, DISEASES OF; FLOUR AND FLOUR MILLING; GYNAECOLOGY AND OBSTETRICS; LEPROSY; MEDICINE; NERVOUS SYSTEM; PHYSIOLOGY; SURGERY.)

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(F. C. BG.)

Vocational Education: *see* EDUCATION, VOCATIONAL.

Vocational Psychology: *see* PSYCHOLOGY, APPLIED.

Von (in personal names): *see* under proper names.

Vuillard, Jean Edouard (1868–1940), French artist, was born in Cuiseaux. He became famous for his paintings of French gardens and interiors and in later years he painted the portraits of leading public men, including Camille Chautemps and Yvon Delbos. His paintings were exhibited throughout Europe and there was an occasional exhibition of them in the United States. He is represented in the Metropolitan Museum of Art in New York city and in the museums of Buffalo and Cleveland as well as in several private collections. He died suddenly in La Baule, June 21.

Wages and Hours. During 1940 employment and pay rolls in manufacturing and non-manufacturing industries improved substantially as a result of European War orders and the U.S. defence program. The improvement was particularly noticeable during the latter part of 1940, for which index numbers on employment and pay rolls were not yet available when Table I was compiled. But official "releases" of the United States department of labour reported several hundred thousands re-employed by private industry during the latter half of 1940. On the whole, Table I and Table II show improved employment and higher average weekly earnings during the first half of 1940 as compared with the first half of 1939. Figures for the latter half of 1940, when available, will show substantial improvement in both employment and weekly earnings.

Employment during the first ten months of 1940 was about 7% better than during the corresponding months of 1939 (Table I). This was caused almost entirely by the improvement in employment in the durable goods industries where employment increased 14% to 20% over the corresponding months in 1939. This rise in durable goods employment continued during the latter half of 1940, for two months of which index numbers were not available.

During the period 1937–39 average hourly earnings increased. This was an unusual event. In periods of increased unemployment, such as prevailed from late 1937 through 1938, labour ordinarily experiences reductions rather than increases in average hourly earnings. The contra-cyclical rise in hourly earnings 1937–39 appears to have been the result principally of the upsurge of unionism which began in 1933–34. By 1937 a large number of the new unions had become sufficiently consolidated and effective, and the older unions sufficiently strengthened, so that their increased bargaining power more than counterbalanced the temporarily adverse business trend of late 1937 and 1938 and enabled them, both in union and non-union industries, to push the wage level higher. In the first half of 1940 the higher hourly earnings were maintained but not increased in the majority of industries. Increases of one to three cents per hour were gained in a few industries (Table II). Demands for higher wages were common late in the year.

Wholesale and retail trade, hotels and public utilities experienced but small reductions in hours from 1937 through 1938–39. They are industries which operate standardized hours if they operate at all, and their employees' hours reflect the operating habits of the industries. But the bureau of labour statistics figures show a downward trend of hours in these industries as well as in manufacturing, mining and construction during the period, and it is probable that it was in part due to reduction in hours-standards effected by union agreements. The rise in hourly earnings rates in 1938–39 as compared with 1937 could be illustrated by a few typical cases. The facts shown by these cases are not, of course, universal, but they reflect the dominant trends of the period.

The much higher hourly earnings in some industries are due to one or more of the following factors: (1) character of the labour supply employed, as to sex, age and skill, (2) productivity of the industry, principally determined by its degree of modernization, technical equipment and proportion of skilled workers, (3) degree to which union working conditions prevail, (4) necessity of paying high wages to attract labour supply.

Table I.—*Employment, Payrolls and Earnings in Manufacturing Industries in the U.S.*

(Indexes are based on 3-year average, 1923–25=100, and are adjusted to 1935 census of manufacturers. Not comparable to indexes published by the U.S. Bureau of Labor Statistics prior to August 1938.)

	All Manufacturers				Durable Goods				Non-Durable Goods			
	Employment		Payrolls		Employment		Payrolls		Employment		Payrolls	
	1940	1939	1940	1939	1940	1939	1940	1939	1940	1939	1940	1939
Jan.	101.4	92.2	98.3	83.7	97.4	82.3	98.2	76.0	105.3	101.7	98.4	92.4
Feb.	101.4	93.6	97.8	86.0	96.6	83.3	96.7	77.7	106.1	103.5	99.1	95.3
Mar.	100.8	94.3	98.2	87.6	96.4	84.1	97.6	79.4	105.1	104.0	99.0	96.7
Apr.	99.6	94.1	96.3	85.5	96.0	84.8	97.2	79.5	103.0	103.0	95.4	92.2
May	99.0	93.0	96.3	85.0	96.5	84.0	97.5	78.8	101.5	101.6	94.9	91.9
June	99.4	93.4	97.9	86.5	97.0	84.6	100.0	80.7	101.7	101.8	95.5	93.0
July	99.5	93.5	96.5	84.4	95.6	83.0	96.0	76.0	103.3	103.5	97.1	93.7
Aug.	103.8	96.3	104.0	89.7	99.8	83.9	105.5	81.5	107.6	108.1	102.4	99.0
Sept.	107.7	100.2	110.0	93.8	105.5	89.8	114.0	87.8	109.7	110.2	105.6	100.5
Oct.	110.1	103.6	114.5	101.6		96.1		99.6		110.8		103.9
Nov.		103.8		101.6		98.2		100.9		109.2		103.4
Dec.		104.1		103.7		100.0		104.6		108.0		102.8

This table compiled from tables published monthly in *The Monthly Labor Review,* United States Bureau of Labor Statistics.

Table II.—*Average Hours per Week, Average Earnings per Hour, and Average Weekly Earnings in Major Industrial Classifications, January and July, 1939 and 1940 in the U.S.*
(Compiled from the *Monthly Labor Review* of the United States Bureau of Labor Statistics)

Industry	Average Hours per Week				Average Earnings per Hour				Average Earnings per Week			
	1940		1939		1940		1939		1940		1939	
	Jan.	July	Jan.	July	Jan.	July	Jan.	July	Jan.	July	Jan.	July
ALL MANUFACTURING INDUSTRIES	37.4	37.3	36.3	36.6	$.663	$.667	$.651	$.643	$25.51	$25.25	$23.81	$23.70
Durable Goods	38.1	37.9	35.8	36.1	.727	.727	.729	.718	28.96	28.52	26.58	26.40
Non-durable Goods	36.9	36.7	36.8	37.0	.607	.615	.585	.581	21.87	21.87	21.27	21.27
Iron and Steel (not including machinery)	37.6	37.2	34.8	34.2	.766	.777	.755	.760	29.07	28.89	26.38	25.80
Machinery	40.4	40.5	36.6	38.0	.735	.744	.724	.724	29.74	30.29	26.50	27.55
Transportation equipment	37.4	36.2	34.8	35.1	.894	.891	.899	.884	33.23	31.88	31.16	30.95
Non-ferrous metals	39.2	38.6	37.0	37.8	.701	.701	.668	.671	27.37	27.12	24.74	25.41
Lumber and products	36.9	37.0	37.1	36.8	.512	.519	.541	.537	19.10	19.37	19.81	19.61
Stone, Clay, Glass	35.1	35.5	35.1	35.3	.664	.665	.651	.646	23.58	23.55	22.98	22.61
Textiles and products	34.8	33.8	34.9	35.2	.499	.502	.484	.471	17.26	16.85	16.73	16.47
Leather and products	37.2	35.9	38.1	37.5	.534	.553	.525	.521	19.89	19.80	19.71	19.70
Food and kindred products	39.7	39.9	40.0	40.1	.641	.624	.628	.615	25.32	24.33	24.93	24.61
Tobacco manufactures	33.3	36.8	32.2	37.0	.496	.502	.481	.476	16.52	18.36	15.61	17.48
Paper and printing	38.1	38.0	37.9	37.5	.784	.791	.765	.770	28.66	29.00	27.80	27.57
Chemicals and petroleum refining	38.4	38.5	38.3	37.9	.756	.783	.744	.770	29.22	30.12	28.63	28.99
Rubber products	36.6	35.7	35.9	36.4	.776	.785	.768	.773	28.54	27.90	27.72	28.22
NON-MANUFACTURING:												
Coal Mining:												
Anthracite	36.8	26.3	27.0	20.1	.919	.918	.928	.931	33.46	23.52	24.74	18.65
Bituminous	29.4	26.6	26.5	24.3	.876	.891	.883	.903	25.71	23.65	23.27	22.11
Metalliferous mining	40.6	38.0	41.3	36.4	.735	.722	.689	.694	29.68	27.34	28.27	25.11
Quarrying and non-metallic mining	34.9	39.8	36.0	39.2	.563	.568	.548	.552	19.66	22.63	19.76	21.66
Crude petroleum	37.5	38.0	37.6	38.0	.888	.876	.880	.883	33.99	33.92	33.08	33.29
Telephone and telegraph	39.2	40.0	39.0	39.4	.805	.798	.822	.815	31.79	31.75	30.89	31.06
Electric light, power and gas	39.1	39.1	38.6	38.6	.887	.891	.870	.869	34.63	34.75	33.52	33.64
Wholesale trade	40.6	41.0	41.7	41.4	.729	.740	.707	.725	29.65	30.41	29.62	29.97
Retail trade	43.0	43.0	42.9	42.6	.541	.553	.551	.557	21.43	21.68	21.71	21.58
Hotels (year-round)	46.2	46.7	46.4	46.8	.332	.331	.319	.319	15.39	15.54	15.01	15.05
Building	30.8	33.6	30.3	33.6	.970	.947	.932	.920	29.74	31.78	28.18	30.85

Weekly earnings are really of greater significance than hourly rates, from the point of view of living standards. There were only five industries of the 24 studied in which average weekly earnings exceeded $30 per week in Aug. 1939, and the maximum was $33.87 in the crude petroleum and electric light and power industries. The lowest weekly earnings were in hotels, $15.13. In July 1940, there were eight industries in which average weekly earnings exceeded $30. Three of these were $34.63 in electric power; $33.99 in crude petroleum and $33.46 in anthracite coal. The lowest, hotels, were but $15.54.

Seven industries fell between $20 and $25 per week and seven between $25 and $30; five below $20 in July 1940.

The wages of farm labour were closely similar in 1940 to 1939, judging by the reports of the U.S. bureau of agricultural economics.

Monthly wages, with board, averaged $29.01 on July 1, 1940, and $28.18 in July 1939; daily wages, with board, $1.37 in July 1940 and $1.62 in 1939. (D. D. L.)

Great Britain.—In Great Britain, over the year 1939 as a whole, average money wage rates rose by between 4% and 4½%, nearly the whole of the increase occurring during the months after the outbreak of war. The largest increases were in the coal mining, transport and textile trades; the engineering and metal trades had only small advances in wage rates, but average earnings increased substantially, owing to overtime and the earning of larger payments on piecework. During 1940 wages advanced further, the reported changes in rates of wages from January to September involving a weekly increase of £1,757,000 in the wages of 7,725,000 workers, as compared with £236,000 and 395,000 workers in the corresponding period of 1939.

These changes were moderate in comparison with the rise in the cost of living, which stood according to the official index at 89% above the 1914 level in Oct. 1940, as against 55% in Aug. 1939. The trade unions in general refrained from pressing large claims for wage advances, in view of the danger of causing an inflationary movement which would neutralize their effect. The consequence was a considerable widening of the gap between average earnings in establishments engaged on urgent war work and elsewhere, and especially between average earnings in the metal and vehicle trades and in trades which were adversely affected by war conditions. Up to the spring of 1940 there was a tendency for employers in the war trades to bid against one another in order to attract skilled workers. But this policy was checked in the summer by an order forbidding firms to advertise for labour, and also by measures which prevented the offer of abnormally high wage rates. Undoubtedly certain limited classes of highly skilled men have been able to earn very large wages with the aid of heavy overtime.

Table III.—*Rise in Hourly Earnings Rates in 1939-40 Compared with 1938 in the U.S.*

Industry	Hourly earnings in January		
	1938	1939	1940
Manufactures in general	$.663	$.651	$.663
Durable goods manufactures	.727	.729	.727
Non-durable goods	.602	.585	.607
Iron and steel	.755	.755	.766
Machinery	.732	.724	.735
Lumber and products	.516	.541	.512
Food and products	.618	.628	.641
Tobacco products	.476	.481	.496
Rubber products	.792	.768	.776
Anthracite mining	.917	.928	.919
Bituminous mining	.871	.883	.876
Wholesale trade	.683	.707	.729
Building	.925	.932	.970

In the factory trades there were numerous relaxations of the Factory acts in order to enable women to work beyond the limits which are allowed in normal times. During the first five months of the war, 2,459 factories were granted relaxation, mostly allowing women and young persons over 16 to work up to a maximum of 57 hours a week, as against the limit of 48 hours fixed by the Factory act of 1937.

In July 1940 the ministry of labour, after consultation with the Trades Union congress and the British Employers confederation, issued a pamphlet drawing attention to the need for a reduction in the excessive hours then being worked in many establishments—often as many as 70 or even 80 hours a week. No fixed standard was laid down, but the general conclusion appeared to be that 60 hours should, save in very exceptional cases, be taken as the absolute limit to be aimed at immediately, with a prospect of further reductions to follow, to 55 or 56 hours "which experience in many manufacturing firms shows to be" the highest level compatible with optimum efficiency. The pamphlet also recommended that firms should give attention to various forms of shifts and rota working, in order to relieve strain and make possible easier transport to and from work. The need for adequate breaks, and for the provision of factory canteens and rest rooms was also stressed; and in November it was announced that an order was to be made making canteens compulsory in all the large and middle sized establishments.

The most important special measure affecting wages during 1940 was the establishment in June of the minimum wage of 48*s.od.* a week for agricultural workers. In other industries wages and conditions were left to be settled by the same methods as in time of peace, subject to the provision of an arbitration system for the adjustment of conditions when the parties were unable to agree. (*See* LABOUR UNIONS.) (G. D. H. C.)

Wagner-Jauregg, Julius (1857–1940), Austrian physician, was born on March 7 and was educated at the University of Vienna and served there as assistant in pathology in 1881–82. He became assistant in the university clinic in psychiatry the next year and remained there until 1899, when he became professor of psychiatry and neurology in Graz university. In 1893 he returned to the University of Vienna, remaining there until he retired in 1928. He was noted for his investigation into the effect of artificial fever in curing disease. In 1917 he found that tertian malaria was the ideal inoculation agent for treating paresis.

In 1927 he received the Nobel prize in medicine for his epoch-making discovery.

He died in Vienna, Oct. 1.

Wake Island, a possession of the United States of America since 1899, lies in the mid-Pacific in lat. 19° 15′ N., long. 166° 38′ E. It is about 2,104 mi. W. of Honolulu, Hawaii and 1,334 mi. from Port Apra, Guam. By executive order dated Dec. 29, 1934, Wake island was placed under the control and jurisdiction of the navy department.

The island did not have native or other regular inhabitants until the Pan American Airways established a base there, under licence from the navy department, as a step in its transpacific clipper air route. (L. S. F.)

Wald, Lillian D. (1867–1940), U.S. sociologist, was born in Cincinnati, O., March 10, and died in Westport, Conn., Sept. 1. For a biographical sketch see *Encyclopædia Britannica,* vol. 23, p. 287.

Wales: *see* GREAT BRITAIN AND NORTHERN IRELAND, UNITED KINGDOM OF.

Walker, Frank Comerford (1886–), U.S. postmaster general, was born at Plymouth, Pa. on May 30. After studying at Gonzaga university in Spokane, Wash. and receiving a law degree at the University of Notre Dame, he was admitted to the Montana bar in 1909. In 1913 he was elected to the state legislature. In 1932 he became actively identified with national politics, as treasurer of the Democratic national committee. He was executive secretary of the president's executive council in 1933 and later director of the national emergency council. On Aug. 31, 1940, President Roosevelt nominated him postmaster general to succeed James A. Farley.

He was confirmed by the senate Sept. 6 and sworn into office Sept. 11.

Wallace, Henry Agard (1888–), vice-president of the United States. See *Encyclopædia Britannica,* vol. 23, p. 303. Wallace was secretary of agriculture in the cabinet of Franklin D. Roosevelt from March 4, 1933 until Sept. 5, 1940, when he resigned to campaign for the vice-presidency to which he had been nominated by the Democratic convention in Chicago July 19. President Roosevelt had picked his running mate after his own nomination for a third term, and there was considerable opposition among the convention's delegates to the naming of Wallace. Both Willkie and McNary, the Republican candidates, paid public tribute during the campaign to Wallace's accomplishments as secretary of agriculture. In his speech of acceptance at Des Moines Aug. 29, Wallace denounced the Republican party as the party of appeasement. After the election Nov. 5 Roosevelt named Wallace as the official representative of the United States at the inauguration of President Manuel Avila Camacho of Mexico at Mexico City Dec. 1.

Wang Ching-wei (1885–), Chinese statesman, head of the Japanese-dominated "National Government of China" at Nanking. He was born at Canton, probably in 1885, although some sources give 1884 or 1883 as his birth date. He studied law in Hosei university, Japan, and while in Tokyo became interested in the revolutionary program of Sun Yat-sen, with whom he later became acquainted.

In 1911, after a term in prison for attempting to assassinate the prince regent, Wang became editor of *Ming Pao,* an organ which advocated establishment of a republic. By 1924 he was Sun Yat-sen's chief adviser and in 1925, after Sun's death, he became chairman of the political council of the Kuomintang. Two years later he resigned after splitting with Chiang Kai-shek, Sun's other prominent disciple, in a quarrel that curiously paralleled the feud between Stalin and Trotsky. Wang was expelled from the Kuomintang in 1929 for plotting against the Nanking government but was reinstated in 1931 and became president of the executive Yuan (1932–35). He was also minister of foreign affairs from 1933 to 1935.

In 1939 he was again ousted by Chiang from the Kuomintang and deprived of all political offices for making peace overtures to Japan.

On March 30, 1940, under the protection of the Japanese army of occupation, Wang set up his puppet government in Nanking and called upon all followers of Chiang to lay down their arms. The "National Government of China" was officially recognized by Japan in a treaty signed Nov. 30. Chiang's answer to this treaty was the offer of a reward of 100,000 Chinese dollars for the capture of Wang.

The U.S. reply was a loan of $100,000,000 to the government of Chiang at Chungking.

War: *see* AIR FORCES; ARMIES OF THE WORLD; CHEMICAL WARFARE; DEFENCE, NATIONAL; EUROPEAN WAR; MUNITIONS OF WAR; STRATEGY OF THE EUROPEAN WAR; SUBMARINE WARFARE; TACTICS IN THE EUROPEAN WAR; ETC.

War Debts. At the end of the World War (1914–18) the United States had acquired obligations of 20 nations in the principal amount of $10,338,312,074.70. Additional obligations amounting to $12,167,000 were acquired from Greece in 1929. Funding agreements with 13 countries were reached during the years between 1923 and 1926; an agreement with Greece was made in 1929, and an agreement with Austria in 1930, setting their debt with interest to the respective funding dates at $11,577,260,885 generally payable with interest charges over a period of 62 years. Of the others Cuba and Liberia paid their debt in full. The unpaid balance of the indebtedness of Nicaragua which consisted of obligations in the principal amount of $289,898.78, together with interest thereon, was cancelled in connection with the settlement of a claim of Nicaragua for refund of certain income taxes paid by the Ferrocarril del Pacifico de Nicaragua (a railroad owned and operated by Nicaragua), under article II of the agreement of April 14, 1938. No agreements were ever reached with Armenia and Russia. (D. W. B.)

Statement Showing the Indebtedness of Foreign Governments to the United States as of June 30, 1940

Country	Principal	Accrued Interest	Total Indebtedness
Funded debts:			
Belgium	$ 400,680,000.00	$ 61,101,161.45	$ 461,781,161.45
Czechoslovakia	165,241,108.90	574,023.20	165,815,132.10
Estonia	16,466,012.87	5,146,581.21	21,612,594.08
Finland	8,039,601.83	87,021.03	8,126,622.86
France	3,863,650,000.00	356,386,473.21	4,220,036,473.21
Germany (Austrian indebtedness)[1]	25,980,480.66	36,23 .49	26,016,720.15
Great Britain	4,368,000,000.00	1,283,792,208.17	5,651,792,208.17
Greece	31,516,000.00	3,235,303.34	34,751,303.34
Hungary	1,908,560.00	528,110.99	2,436,670.99
Italy	2,004,900,000.00	22,001,552.35	2,026,901,552.35
Latvia	6,879,464.20	2,032,555.25	8,912,019.45
Lithuania	6,197,682.00	1,782,466.92	7,980,148.92
Poland	206,057,000.00	64,407,503.99	270,464,503.99
Rumania	63,860,560.43	1,968,192.47	65,828,752.90
Yugoslavia	61,625,000.00	231,093.78	61,856,093.78
Total	$11,231,001,470.89	$1,803,310,486.85	$13,034,311,957.74
Unfunded debts:			
Armenia	11,959,917.49	12,441,182.69	24,401,099.98
Russia	192,601,297.37	207,327,616.21	399,928,913.58
Total	$ 204,561,214.86	$ 219,768,798.70	$ 424,330,013.56
Total of above	$11,435,562,685.75	$2,023,079,285.55	$13,458,641,971.30
Germany[2]			
Army costs (reichsmarks)	997,500,000.00	25,446,007.78	1,022,946,007.78
Awards of Mixed Claims Commission (reichsmarks)	2,040,000,000.00	72,420,000.00	2,112,420,000.00
Total (reichsmarks)	3,037,500,000.00	97,866,007.78	3,135,366,007.78
Total (in dollars at 40.33 cents to the reichsmark)	$ 1,225,023,750.00	$ 39,469,360.94	$ 1,264,493,110.94

[1] The German government has been notified that the government of the United States will look to the German government for the discharge of this indebtedness of the government of Austria to the government of the United States.
[2] Indebtedness to the United States under agreements of June 23, 1930 and May 26, 1932.

War Propaganda: *see* PROPAGANDA.

Washington, a state in the extreme northwest United States, popularly known as the "Evergreen state." Area, 66,836 sq.mi.; tidal shore line, 1,721 mi.; population (U.S. census 1930) 1,563,396; (U.S. census 1940) 1,736,191; represented an increase of 11.1% during decade 1930–40 as against 15.2% for the previous decade. Capital, Olympia, 13,254; three largest cities: Seattle, 368,302; Spokane, 122,001; Tacoma, 109,408. The urban population was 921,969 or 53.1%. In 1930 native-born whites dominated population percentages with 81.7%; of the 244,256 foreign-born whites, Canada, Sweden, Norway, Germany and Great Britain furnished one-half. Negroes numbered 6,840; Japanese, 17,837; Chinese, 2,195; Filipinos, 3,480; Indians (Jan.

1939), 13,913.

History.—A record in number of citizens registered and in votes cast by the electorate marked the 1940 elections. In the Democratic primaries, a spirited contest between Governor Clarence D. Martin, presenting himself for a third term, and ex-Senator Clarence C. Dill, resulted in the nomination of the latter. He was, however, defeated in the final election by Republican Arthur B. Langlie, mayor of Seattle, by a vote so close that the outcome was not determined until the count of the unusually numerous absentee ballots was made. Notice was given that the gubernatorial election would be contested because of the counting of ballots (party column) showing irregular cross marking. There were 5 incumbents among the 7 Democratic state officers elected on party tickets. For the non-partisan post of superintendent of public instruction, Pearl A. Wanamaker defeated Stanley F. Atwood, incumbent. For United States senator, Mon C. Wallgren, former congressman from the 2nd district, won from Republican Stephen F. Chadwick of Seattle, former national commander of the American Legion. Six Democrats, 5 re-elected, were sent to congress. President Roosevelt's popular vote for the state's 14 electoral votes exceeded that of any candidate on the state ballot, 462,145 to 322,123 for Wendell L. Willkie.

ARTHUR LANGLIE, Republican, won Washington's election for governor Nov. 5, 1940, after a close race

The legislature in its 27th session consisted of 38 Democrats and 8 Republicans in the senate and 70 Democrats as against 29 Republicans in the assembly.

The chief state officers: Arthur B. Langlie, governor; Victor A. Meyers, lieutenant governor; Mrs. Belle Reeves, secretary of state; Cliff Yelle, state auditor; Otto A. Case, state treasurer; Smith Troy, attorney-general; Progressive, Jack Taylor, commissioner of public lands; William A. Sullivan, insurance commissioner; Pearl A. Wanamaker, superintendent of public instruction.

The collapse of the Tacoma Narrows bridge completed during 1940 was a catastrophe in which there were no casualties and in which the loss was covered by insurance.

Education.—The system of higher education included a university, a state college and three colleges of education. During the school year 1939–40, average daily attendance in elementary and secondary schools was 274,565, the number of teachers exclusive of principals and superintendents, employed therein, 10,583. Total instructional cost was $29,442,858.32 and such cost per pupil in daily attendance $107.23. Salaries of teachers, exclusive of superintendents, averaged $1,641.17.

Banking and Finance.—Revenues and expenditures for the biennium ending Sept. 30, 1940 represented an increase over previous years. Gross revenues amounted to $188,555,335.88; the cash balance as of Sept. 30, 1938 was $11,764,159.91. The gas tax contributed $35,410,151.70, and the sales tax $55,482,928.39. As total disbursements amounted to $183,626,693.11, the cash balance on Sept. 30, 1940 was $16,692,802.68. The bonded debt was $7,496,000. One hundred and forty-two banks in the state reported total capital of $25,861,000; capital, surpluses and undivided profits of $46,588,000; deposits of $598,518,000; resources of $657,874,000.

Agriculture, Manufactures and Mineral Production.—Statistics for the decade 1930–40 revealed the trend toward a reduction of income from farm crops of about one-third over the previous decade ($122,949,000 in 1929 to $80,208,000 in 1939).

Production of Farm Crops of the State of Washington

Leading crops	Value 1939	Av. Prod. 1939–38	Prod. 1939	Prod. 1940 (est.)
Wheat	$28,484,300	44,421,000 bu.	43,822,000 bu.	42,982,000 bu.
Apples (commercial crop)	18,200,000	29,411,000 bu.	26,000,000 bu.	28,804,000 bu.
Hay (wild and tame)	16,810,100	1,671,000 tons	1,925,000 tons	1,960,000 tons
Potatoes	4,410,000	8,368,000 bu.	7,350,000 bu.	7,560,000 bu.
Oats	3,927,350	7,791,000 bu.	11,221,000 bu.	9,360,000 bu.
Pears	3,120,660	4,781,000 bu.	5,779,000 bu.	6,585,000 bu.

In lumber, the second largest wealth producer for Washington which outranks all states, there was a definite improvement since 1937. Salmon and halibut constituted the basis of sea food production in which the state is also first. Most conspicuous, however, was the upward surge in mining. Copper production which in 1937 amounted to but 128,000 lb., jumped to 12,034,000 lb. in 1938 and 17,996,000 lb. in 1939. During 1937, 3,057 manufacturing concerns produced goods valued at $675,640,000.

(H. J. De.)

Washington, District of Columbia, U.S., during the decade which ended with the 1940 census, increased in population 36.2%, a rate more than three times that of the previous decade. The federal city thus advanced from 15th to 11th place among the cities of the country. Pop. (1930) 486,869; (1940) 663,091, federal census. In the Washington region, covering a territory within about a 20-mi. radius of the White House, the increase was 43%, making a total population of nearly 1,000,000.

The National Capital Park and Planning commission in 1940 completed ten years of park-purchase operations under the Capper-Cramton act of May 29, 1930. In the regional park plan, the section of the George Washington Memorial parkway, extending from Mount Vernon and Ft. Washington 30 mi. along the Potomac river to Great Falls, was being built from the Maryland line to Great Falls. A new section of the parkway was being developed in Alexandria.

During 1940 the National Park service completed development of the Rosslyn plaza and the additional span over the Key bridge as a part of the Memorial parkway and the C. & O. canal, purchased by the National Capital Park and Planning commission, was opened for recreational use between Washington and Seneca, a distance of 22 mi. The war department transferred to the National Park service the entire 341 ac. of Ft. Washington, as authorized in the Capper-Cramton act. In co-operation with the Maryland National Capital Park and Planning commission and the United States engineer office, plans were developed for a joint flood control and park project in Anacostia River park beyond the district line. This will form a link of the Baltimore-Washington parkway extending along the northeast branch of the river.

Within the District of Columbia the National Capital Park and Planning commission acquired about 90% of the land for the Fort drive, a 23-mi. parkway encircling the city. During the fiscal year of 1940 somewhat over $1,000,000 was expended for land acquisitions for parks, parkways and playgrounds for Washington. In the development of the city and regional plan of Washington, special attention was paid to plans for public buildings in the central area, the development of modern zoning regulations, and the formulation of a preliminary metropolitan area

plan. Following the recommendation of the Planning commission, the president submitted to congress for the first time a proposal for an office building east of the capitol. Other public building proposals included acquisition of land for a state department annex north of the present building, a site for the coast guard on the Washington channel water-front, and sites for a west central heating plant and the general accounting office. Appropriations were made for the last two. Approval was also given to the plan for a memorial garden to Oliver Wendell Holmes in the rear of the Supreme Court building as a part of the general East Capitol street plan.

With the advice of Harland Bartholomew and Alfred Bettman, planning consultants, the Planning commission was modernizing the zoning regulations. In 1940 the Alley Dwelling authority leased Langston from the United States Housing authority and was operating the housing project on a system of graded rents. The current construction program included about 3,000 dwellings in 10 projects. The housing projects erected under the Alley Dwelling Authority act were being operated on a sound economic basis, with no subsidies. (H. Js.)

Washington National Airport: *see* AIRPORTS AND FLYING FIELDS.

Water Power. Increase of installed capacity of water wheels reported in 1940: 3,400,000 h.p. Total reported capacity Jan. 1, 1941, about 69,400,000 h.p., on the basis of the report of the United States Geological survey. Of the increase in installed capacity, about 36% was in plants that were not reported in detail (principally in Japan), some of which were probably built prior to 1940, and 64% in plants listed below. Even the figures here given for both the installations in 1940 and the total installations, are incomplete, since China, France, Germany, Great Britain, Italy and Japan stated that it was inadvisable to submit reports because of war conditions.

The following water power plants and capacities in different countries were reported as completed in 1940 or under construction at the end of the year, with a few plants completed previously but reported too late for the previous year's record.

Alaska: Three small plants, totalling 221 h.p., to be completed in 1941.

Algeria: On Fodda river near Uued Fodda, 13,400 h.p., under construction, date of completion not stated.

Argentina: On Andalgalá river at Andalgalá, Catamarca, addition of 134 h.p., making capacity 218 h.p.; on Curi Leuvu river at Chos Malal, Neuquen, 67 h.p. Under construction: On Tercero river at Almafuerte, Córdoba, 14,500 h.p.; and on Sauces river at Pozos, Córdoba, 5,400 h.p., to be completed 1943.

Bolivia: On Zongo river near La Paz, addition of 2,500 h.p., making capacity 6,750 h.p.

Brazil: On Cupioba-Assu river at Sao Felipe, Bahia, 41 h.p.; on Ribeirao Cambe river at Londrina, Parana, 370 h.p.; on Indios river at Chapeco, Santa Catharina, 50 h.p.; on Pardo river at Candelaria, Rio Grande do Sul, 162 h.p.; at junction of Anicuns and Pianco rivers at Anapolis, Goyas, 540 h.p.; on Piracicaba river at Rio Piracicaba, Minas Geraes, 13,400 h.p.; on Orfaos river at Joao Pinheiro, Minas Geraes, 29 h.p.; on Peixe river at Martinopolis, São Paulo, 2,280 h.p.; on Ribeirao das Lages river at Pirai, Rio de Janeiro, addition of 47,000 h.p., making capacity 127,000 h.p. On Una river at Agua Preta, 510 h.p.; on tributary of Camaragibe river at Ribeirao, 150 h.p.; on Ipojuca river at Bonita, 600 h.p.; on Serinhaem river at Gamelleira, 200 h.p. Plants under construction, dates of completion unknown: On Serinhaem river at Serinhaem, 650 h.p.; on Una river at Palmares, 330 h.p.; on Mundu and Corrente rivers at Corrente, 330 h.p.; on São Francisco river at Itaparica, 2,000 h.p. The following 7 plants were completed before 1940 but were not reported: On Carneirinhos river 2 plants at Rio Piracicaba, Minas Geraes, 844 h.p. and 568 h.p.; on Ribeirao Santo Antonio river at Minas Novas, Minas Geraes, 24 h.p.; on Novo river at Aguas Belas, Minas Geraes, 84 h.p.; on Meia Ponte river at Inhumas, Goyaz, 98 h.p.; on Peixe river at Piedade, São Paulo, 2,570 h.p.; on Pirapora river at Piedade, São Paulo, 245 h.p.

Canada: New water power installations during 1940 totalled 302,690 h.p., the largest increase in any of the last five years, bringing the total capacity of water power plants to 8,584,438 h.p. About two-thirds of the increase was in new plants and the balance in additions to existing plants. New plants were completed as follows: On St. Maurice river at La Tuque, Que., 178,000 h.p.; on Black river at Hollow Bridge brook, N.S., 7,500 h.p. Additions were completed as follows: On Kootenay river near Nelson, B.C., 50,000 h.p.; on Millstone river on Vancouver island, 7,500 h.p.; on English river at Ear Falls development, Ont., 7,500 h.p.; on South river near South River, Ont., 380 h.p.; on Whitefish river at Whitefish Falls, Ont., 160 h.p.; on St. Lawrence river at Beauharnois, Que., 53,000 h.p.; on Saguenay river at Chute à Caron, 5,000 h.p. The following plants were under construction, to be completed as indicated: On Kootenay river below Nelson, B.C., 90,000 h.p., date of completion not stated; on Yellowknife river north of Yellowknife, Yukon, 4,700 h.p., 1941; on Montreal river at Upper Falls, Ont., extension 10,000 h.p., 1941; on Musquash river at Big Eddy, Ont., 10,000 h.p., 1941; on Madawaska river near Calabogie, Ont., 56,000 h.p., 1942; on St. Lawrence river at Beauharnois, Que., extension 53,000 h.p., 1941 and preparation for two additional units of same size is under way; on upper Ottawa river, Que., 48,000 h.p., 1941; on outlet of Cameron lake, Temiskaming Co., Que., 250 h.p., 1941; on Black river at Pembroke, Que., extension 2,200 h.p., 1941.

Chosen: On Yalu river at Suiho, North Heian province, 400,000 h.p. installed, ultimate capacity 933,000 h.p., to be completed in 1942; on Yujo river at Funei, North Kankyo province, 40,000 h.p.; on Kyosen river at Kyosenko, North Kankyo province, 293,000 h.p.; on Yalu river at Gishu and Ingen, 453,000 h.p., to be completed in 1942, to be divided equally between Chosen and Manchoukuo; on Kinko river in South Chusei province, 101,000 h.p., date of completion not stated; on Kan river at Seizen, Kogen province, 400,000 h.p., to be completed in 1942.

Colombia: Surveys completed for plant on Nima river at Palmia, Valle del Cauca, initial capacity 3,350 h.p., ultimate 7,400 h.p., to be completed 1941–42; on Nare river near Puerto Berrío, Antioquia, 5,000 h.p., to be completed 1941.

Costa Rica: On "Quebrada Avance" at La Union, Tres Ríos, 348 h.p.; on Tapesco river at Tapesco de Alfaro Ruis, Alajuela, 16 h.p.

Cuba: On San Juan de Letran river at Trinidad, Las Villas, 208 h.p., date of completion not stated.

Ecuador: On Pilalo river at Macuchi, Cotopaxi, 1,200 h.p.; on Granobles river at Tabacundo, Pichincha, 62 h.p., to be completed 1941.

Egypt: On Wadi drain in Fayoum, 4,634 h.p.; on conversion canal from Nile river near Fuad I Barrage, Qena, 4,080 h.p., completed in 1940.

Eire: On Liffey river at Poulaphuca near Dublin, 45,000 h.p., to be completed 1941.

Finland: Seven plants under construction to be completed on dates indicated: On Kajaanin river at Kajaani, extension 2,000 h.p., making capacity 5,000 h.p., 1941; on Kajaanin river at Kajaani, 8,000 h.p., 1943; on Paatsjoki river at Inari, 39,500 h.p., 1941; on Paijanteen river at Vaajakoski, 2,900 h.p., 1941; on Oulunjoki river at Oulu, 41,500 h.p., 1943; on Kyminjoki river at Kuusankoski, 40,000 h.p., 1943; on Kokemaenjoki river at Kokemaki, 47,000 h.p., 1943.

Honduras: On tributaries of Choluteca river at La Leona, Tegucigalpa, 500 h.p.

Hungary: Plants under construction, date of completion not stated: On Ung river at Felsodomonya, 3,640 h.p., and at Ungvar, 2,600 h.p., on Hernad river at Kesznyeten, 3,000 h.p.

Iceland: On Budara river at Reydarfjordur, extension of 87 h.p., making capacity 260 h.p.

India: On Swat river at Jabban, Malakand, 12,850 h.p.; on Sharavathi river at Jog or Gersoppa Falls, ultimate 100,000 h.p., construction started but discontinued, on account of world conditions; on Pykara and Mukurti rivers in Nilgiris district, Madras, addition of 67,000 h.p., making capacity 92,100 h.p.; on Shimsha river at Shimshapura, 23,000 h.p., under construction, completion delayed by war; on Muderapuzha, Periyar river at Pallivasal Munnar, 18,000 h.p., ultimate 36,000 h.p., completion not stated; on Tambraparni river in Tinnevelly district, Madras, 23,300 h.p., to be completed 1941.

Italy: Plans formulated by a state commission in 1937 to increase capacity of water power plants by about 30%. Forty new plants with capacity of 230,000 h.p. have been completed and 89 plants with capacity of 816,000 h.p. are under construction to be completed 1942. (Abstracted from address by minister of public works, delivered April 24, 1940.)

Jamaica: On Volute river at Retreat, 120 h.p.

Lithuania: On Sesupe river at Naumiestis, Sakiai, 268 h.p.; on Neris river at Turniskas, Vilnius, 20,000 h.p., to be completed 1942.

Mexico: On Xia river near Calpulalpau, Oaxaca, 500 h.p.; on San Pedro river 45 mi. north of Boquilla dam, Chihuahua, 1,800 h.p.; on Grande de Morelia river near Lago de Patzcuaro, Michoacan, 5,600 h.p.; on Caracha river 40 mi. south of Lago de Patzcuaro, Michoacan, 700 h.p.; on Azul river east of Chilpancingo, Guerrero, 7,500 h.p. To be completed in 1941 or later: On Cupatitzio river near Cruapau, 8,000 h.p. and near Uruapam, Michoacan, 6,200 h.p.; on Ingenio river northeast of Tepic, 430 h.p., ultimate 4,300 h.p. and north of Tepic, Nayarit, 3,200 h.p.; on Nazas river east of junction of Ramos river, Durango, 90,000 h.p.; on Jaripo river near Juiguilpan, Michoacan, 1,575 h.p.; on unknown river, 20 mi. west of Juiguilpan, Michoacan, 83 h.p.; on Chupio river near Chupio, Michoacan, 940 h.p.; on Apatlaco river near Ceurnavaca, Morales, 418 h.p.; on Tilostoc river west of Valle de Bravo, 41,400 h.p., ultimate 125,000 h.p.; on Azul river southeast of Chilpancingo, Guerrero, 10,700 h.p.; on Santiago river at Guadalajara, Jalisco, addition making capacity 6,000 h.p.

Morocco: On Cum-er-Rebia river near Kasbah Tadla, 9,400 h.p.; on N'Fis river at Lalla Takerkoust, Western Marrakesh, capacity not reported, completion delayed by war conditions.

Newfoundland: On Tors Cove river at Tors Cove, 8,400 h.p., to be completed 1941. Capacity of all plants 236,000 h.p.

New Zealand: On Waitaki river at Kurow, addition of 40,000 h.p., making capacity 80,000 h.p.; on Waikato river at Arapuni, addition of 56,000 h.p., making capacity 195,000 h.p., to be completed 1941; on Waikaretaheke river at Tuai, 53,000 h.p., to be completed 1941; on Waikato river at Karapiro, 120,000 h.p., to be completed 1943; on Waitaki river at Lake Tekapo, 28,800 h.p., to be completed 1943; on Rangitata river at High Bank, 31,600 h.p., to be completed 1941; on Waipori river at Waipori, addition of 8,000 h.p., making capacity 31,200 h.p., to be completed 1941; on Cobb river near Mt. Cobb, 16,000 h.p., to be completed 1942.

Nicaragua: On Yy river, 17 mi. northwest of Siuna, 1,800 h.p., to be completed 1941; on Carca river at San Gregorio mine, 140 h.p.

Peru: On Chili river at Charcani, Arequipa, 2,640 h.p.; on Chicama river

at Usquil, Trujillo, 36 h.p.; on Huallaga river at Huánuco, 446 h.p.; on unknown river at Hualgayoc, 39 h.p.; on unknown river at Cabana, Ancash, 27 h.p.; on unknown river at Anta, Cuzco, 12 h.p. and on unknown river at Paucarbamba, 20 h.p., to be completed 1941; on Torrioc river at Janchiscocha, Jauja, 168 h.p.

Philippine Islands: On Priusa river near sources, Laguna, San Pablo, 120 h.p. extension; on Caliraya river at Lumban, Laguna, 37,500 h.p., to be completed 1942, ultimate capacity 50,000 h.p.; on Laloy river and Malinao creek and tributaries at Lubuagan, Kalinga, capacities not given, combined heads about 12,500 ft., date of completion not stated.

Spain: On Ebro at Flix, Tarragona, 60,000 h.p., to be completed 1945; on Ter river at Pasteral, Gerona, 2,000 h.p. to be completed 1942. Repairs to war-damaged plants under way.

Sumatra: On Asahan river at Wilhelmina Falls, Tapanoeli, 67,500 h.p., to be completed 1944, depending on political situation.

Switzerland: On Aare river at Innertkirchen, Berne, 165,000 h.p., to be completed 1942; on Rhine river at Rekingen, Aargau, 48,000 h.p., to be completed 1941; on Rhone at Geneva, 94,500 h.p., to be completed 1942.

Thailand (Siam): On Meklong river at Saiyoke, Changvad, project under way, estimated cost $3,500,000. Date of completion indefinite.

Union of South Africa: Additions were made to plants at Mbabane, Swaziland, at Lydenburg and Nelspruitt, Transvaal, and at Villiersdorp, Cape Province, total about 500 h.p., names of rivers not given.

Union of Soviet Socialist Republics: On Chirchik river at Chirchik, Uzbek (Asia), 57,500 h.p.; on Volga river at Uglich, Moscow Oblast, 147,500 h.p. The following projects are under construction, date of completion as indicated: On Volga river in Kuibyshev Oblast, 4,560,000 h.p., 1945–46; on Volga river at Rybinsk, Yaroslavl Oblast, 440,000 h.p., 1943; on Irtysh river at Ust-Kamenogorsk, Kazakstan (Asia), 320,000 h.p., 1944–45.

United States: Water power plants and additions to existing plants were completed as follows: Two plants in California on All-American canal from Colorado river, 20,800 h.p.; on Eel river at Potter valley, Calif., extension of 6,500 h.p., making capacity 14,500 h.p.; on Flint river near Warwick, Ga., extension 6,800 h.p., making total capacity 14,000 h.p.; on Snake river near Idaho Falls, Ida., 2,500 h.p., ultimate capacity 5,000 h.p.; on North Santiam river at Idanha, Ida., 340 h.p.; on Ossipee river at Kezar Falls, Me., plant rebuilt increasing capacity from 200 h.p. to 500 h.p.; on Kennebec river at Bingham, Me., addition 34,000 h.p., making total capacity 102,000 h.p.; on Penobscot river at Mattawamkeag, Me., addition 6,250 h.p., making total 18,050 h.p., another unit to be added in 1941; on North Platte river near Brady, Neb., 24,000 h.p.; on Rio Grande at Elephant Butte dam, N.M., 34,500 h.p.; on Hiawassee river near Murphy, N.C., 80,000 h.p., ultimate 160,000 h.p.; on Saluda river near Chappells, S.C., 22,000 h.p.; on Rocky river near Lowndesville, S.C., 3,500 h.p.; on Tennessee river at Chickamauga, Tenn., 108,000 h.p., ultimate 144,000 h.p.; on Colorado river at Austin, Tex., 20,000 h.p., ultimate 27,000 h.p.; on Fox river at Kaukauna, Wis., 3,200 h.p., ultimate 8,000 h.p.; on Columbia river at Bonneville, Wash.–Ore., extension 148,000 h.p., making total 416,000 h.p., ultimate 712,000 h.p., scheduled for completion in 1944; on Vacas river near Guyama, Puerto Rico, two plants, 17,000 h.p. The following plants and additions to existing plants were under construction: On Tennessee river at Guntersville, Ala., extension 34,000 h.p., making total 136,000 h.p., the ultimate capacity; at Wilson dam, Florence, Ala., 140,000 h.p. to be added by 1942, making total 440,000 h.p., ultimate 700,000 h.p.; at Wheeler dam, Ala., 90,000 h.p., to be added by 1941, making capacity 180,000 h.p., ultimate 360,000 h.p.; on Colorado river near Parker, Ariz., initial capacity 120,000 h.p., to be completed in 1942, ultimate capacity 160,000 h.p.; on Colorado river at Boulder, Ariz.–Nev., extensions totalling 875,000 h.p. in progress, ultimate capacity 1,835,000 h.p., to be completed 1945; on Sacramento river near Kennett, Calif., initial capacity 412,000 h.p., to be completed in 1943, ultimate capacity 515,000 h.p.; on Blue river near Kremmling, Colo., 30,000 h.p., to be completed 1942, part of Colorado-Big Thompson project involving 6 power plants with an ultimate capacity of 190,000 h.p.; on Snake river at Minidoka, Ida., extension of 7,000 h.p., making total 20,500 h.p., to be completed in 1942; on Tennessee river at Gilbertsville, Ky., initial capacity 176,000 h.p., to be installed in 1945, ultimate 220,000 h.p.; on Missouri river at Fort Peck, Mont., initial capacity 70,000 h.p., ultimate 150,000 h.p., date of completion uncertain; on North Platte river near Lexington, Neb., two plants, initial capacity 48,000 h.p., ultimate 72,000 h.p., to be completed in 1941; on Nantahala river at Nantahala, N.C., 60,000 h.p., to be completed in 1941; on West Fork of Tuckasegee river near Glenville, N.C., 30,000 h.p., to be completed in 1941; on Yadkin river at High Point, N.C., 8,000 h.p., to be completed in 1941; on Neosho (Grand) river near Pensacola, Okla., initial capacity 80,000 h.p., to be installed in 1941, ultimate capacity 120,000 h.p.; on Rocky river near Lowndesville, S.C., 4,115 h.p., to be completed in 1941; diversion from Santee river near Moncks Corner, S.C., initial capacity 173,300 h.p., ultimate 213,300 h.p.; on Tennessee river at Pickwick Landing, Tenn., 96,000 h.p., to be added by 1942, making capacity 192,000 h.p., ultimate 288,000 h.p.; at Ft. Loudon, Tenn., 88,000 h.p., to be installed in 1944, ultimate 132,000 h.p.; at Watts Bar, Tenn., 126,000 h.p., to be installed in 1942, ultimate 210,000 h.p.; on Holston river at Cherokee dam, Tenn., initial capacity 124,500 h.p., to be installed in 1942, ultimate 166,000 h.p.; on Red river at Denison, Tex., initial capacity 97,000 h.p., ultimate 242,500 h.p., date of completion uncertain; on Brazos river near Palo Pinto, Tex., initial capacity 34,000 h.p., to be installed in 1941, ultimate 51,000 h.p.; on Colorado river 15 mi. northwest of Austin, Tex., initial capacity 67,000 h.p., to be installed in 1941, ultimate capacity 100,000 h.p.; on Columbia river at Grand Coulee, Wash., initial capacity 450,000 h.p. to be installed in 1941–42, and 1,350,000 h.p. by 1947, ultimate 2,700,000 h.p.; on Skagit river at Ruby dam, Wash., ultimate 480,000 h.p.; on Flambeau river at Ladysmith, Wis., addition of 1,000 h.p., to be completed in 1941, making capacity 3,000 h.p. The total capacity of water-power plants of 100 h.p. or more in the United States at the end of 1940 was about 19,000,000 h.p.

Uruguay: On Negro river at Rincon del Bonete, 161,000 h.p., under construction, completion dependent on getting equipment from Germany.

Yugoslavia: On Temska river near Pirot, 670 h.p.; on Letnica river at Ramno, 168 h.p.; on Trebisnica river at Pares, 600 h.p.

The following countries reported no water power plant construction in 1940: Azores, Bahamas, Bermuda, British Guiana, British Honduras, British West Indies, Canary Islands, Chile, Costa Rica, Denmark, Dominican Republic, El Salvador, Gibraltar, Guatemala, Haiti, Martinique, Morocco, the Netherlands, Newfoundland, Panama, Paraguay, Portugal, Venezuela.

WORLD WATER-POWER RESOURCES AND THEIR UTILIZATION

The capacity of a water-power site—the water-power resource at a site—is directly proportional to both the quantity of water and the amount of fall, or the head. Hence, large rivers or considerable fall or both, in regions of sufficient precipitation to produce sustained stream flow, are needed for the generation of great quantities of water power.

Water-power resources are utilized only where there is need for the energy that may be generated. Such need must generally relate to industry, transportation, lighting and heating. The extent of the use of water power will depend upon costs of developing individual sites, distances of transmission to power markets, climate, plane of living of the people of the region, local availability of fuels and other natural resources, transportation facilities, availability and cost of capital, quality and cost of labour, governmental attitude toward industrial development and other factors. The utilization of electric energy is promoted by the interconnection of water-power plants and fuel-power plants to form great power systems of generation and distribution by which the supply of energy and the market for it are stabilized and assured.

Table I.—*Countries or Regions Which Have 25,000 Horsepower or More in Water Wheels*

Country or Region	Capacities of installed water wheels (horsepower)	Potential water-power resources based on ordinary minimum flow (horsepower)	Country or Region	Capacities of installed water wheels (horsepower)	Potential water-power resources based on ordinary minimum flow (horsepower)
Africa			*Europe—Cont.*		
Belgian Congo and Belgian mandate	70,000	130,000,000	Rumania	127,000	3,000,000
Morocco and Algeria	71,400	650,000	Spain	1,400,000	5,700,000
All others	67,900	143,350,000	Sweden	2,425,000	4,000,000
Sum	209,300	274,000,000	Switzerland	3,000,000	3,600,000
Asia			U.S.S.R.	1,850,000	14,000,000
Asia Minor	48,300	700,000	Yugoslavia	250,000	4,000,000
Chosen (Korea)	1,145,000	3,000,000	All others	70,000	1,600,000
India and Ceylon	600,000	39,000,000	Sum	30,002,000	74,000,000
Japan	6,000,000	7,000,000	*North America*		
Siam and Malay States	50,000	5,700,000	Alaska	45,027	1,400,000
Taiwan (Formosa)	237,000	1,000,000	Canada	8,584,438	25,500,000
U. S. S. R.	134,500	64,000,000	Costa Rica	31,000	1,400,000
All others	6,800	30,600,000	Guatemala	35,000	2,100,000
Sum	8,221,600	151,000,000	Mexico	470,000	8,500,000
Europe			Newfoundland	251,000	600,000
Belgium	32,000	small	Panama	40,000	700,000
Bulgaria	70,000	300,000	United States	19,000,000	33,500,000
Czechoslovakia	310,000	700,000	West Indies	50,000	200,000
Eire	140,000	300,000	All others	61,200	3,100,000
Finland	820,000	2,500,000	Sum	28,567,665	77,000,000
France	5,400,000	6,000,000	*Oceania*		
Germany	3,700,000	3,550,000	Australia and Tasmania	250,000	1,000,000
Great Britain and Northern Ireland	550,000	700,000	Hawaii	32,000	150,000
Italy	6,250,000	6,100,000	Java	140,000	1,000,000
Latvia and Lithuania	100,000	150,000	New Zealand	425,000	2,000,000
Norway	3,275,000	16,000,000	Philippine Islands	27,000	2,000,000
Poland	128,000	1,350,000	All others	25,500	14,850,000
Portugal	105,000	450,000	Sum	899,500	21,000,000
			South America		
			Argentina	67,000	5,400,000
			Brazil	1,100,000	36,000,000
			Chile	225,000	3,600,000
			Colombia	25,000	5,400,000
			Peru	175,000	6,400,000
			All others	58,000	17,200,000
			Sum	1,650,000	74,000,000

Table II.—*Summary of Water-Power Resources by Continents*

Continent	Horsepower	Percentage of total resources
Africa	274,000,000	40.9
Asia	151,000,000	22.5
Europe	74,000,000	11.0
North America	77,000,000	11.5
Oceania	21,000,000	3.1
South America	74,000,000	11.0
Totals	671,000,000	100.0

Table III.—*Capacity of Installed Water Wheels by Continents*

Continent	Horsepower	Percentage of total water-wheel capacities
Africa	210,000	0.3
Asia	8,220,000	11.9
Europe	29,930,000	43.0
North America	28,540,000	41.1
Oceania	900,000	1.3
South America	1,650,000	2.4
Totals	69,450,000	100.0

Rivers are used also for other purposes—navigation, irrigation and municipal and industrial water supplies—and some uses conflict with others. Conflicts in use are best resolved by such co-ordination of all uses as will serve most effectively the interests of the people and, therefore, of the nations. The uses should be co-ordinated also with the construction and operation of storage reservoirs and with other devices for controlling quantities and times of stream flow. Only by optimum combinations of resources, development and utilization, have reasonably complete and satisfactory uses of water-power resources been obtained.

Direct comparison cannot be made between the resources and installed capacities shown in the tables as they are not and cannot be presented on the same basis; the former can be presented only on a uniform basis of fall and some selected stage of flow, the latter must be presented on the variable basis of installed capacities which in some instances of stand-by plants built in connection with large reservoirs may be many times those needed for minimum flows and which average two or three times the capacities needed for ordinary minima.

The wide variations in potential water power and in the factors which are favourable to its development lead to great differences in the utilization of the water-power resources of different countries.

This is shown by the statistics on page 715 of resources and installed water wheels, compiled from mimeographed reports of the United States Geological Survey. (*See* also DAMS; ELECTRIC TRANSMISSION AND DISTRIBUTION; TENNESSEE VALLEY AUTHORITY.) (N. C. G.)

Water Supply and Sewage: *see* PUBLIC HEALTH ENGINEERING.

Watrous, Harry Willson (1857–1940), U.S. artist, was born in San Francisco, Calif., Sept. 17. He studied art in the Atelier Bonnât and Académie Julian in Paris and devoted himself to genre painting, specializing in small figures with much detail. He won the Clark prize of the National Academy of Design in 1894 and received a gold medal at the St. Louis exposition. In 1929 the Altman prize of $1,000 was awarded to him by the National academy. He won many other prizes and medals, and was president of the National Academy of Design in 1933. Watrous died in New York city, May 10.

Watts Bar Dam: *see* TENNESSEE VALLEY AUTHORITY.

Waugh, Frederick Judd (1861–1940), U.S. artist, was born in Bordentown, N.J., Sept. 13, the son of a portrait painter. He received his art education in the Philadelphia Academy of the Fine Arts and the Académie Julian in Paris and exhibited in the Paris salon and in the Royal academy in London. He devoted himself to painting the sea in its various phases and his marines are in museums in many cities of the United States, England and South Africa. He received the National Academy of Design's Palmer Memorial Marine prize of $1,000 for a painting in 1929, and for five years his paintings in the annual exhibition of the Carnegie institute in Pittsburgh won the popular prizes. He died in Provincetown, Mass., Sept. 10.

Wavell, Sir Archibald Percival (1883–), British soldier, born in May, was the son of Maj. Gen. A. G. Wavell. Following his father's career, he enlisted in the Black Watch in 1901 after studying at the royal military college and the staff college and saw action in the Boer war, in India and the World War of 1914–18. He then served with the Egyptian expeditionary force until 1920. In 1938 he was promoted to lieutenant general. From 1937 to 1938 he commanded the British troops in Palestine and Trans-Jordan, and in 1940 he became commander in chief of the British armed forces in the middle east. In this office his biggest problem was the Italian invasion of Egypt which began Sept. 12 and advanced as far eastward as Sidi Barrani.

Wealth and Income, Distribution of.

There are three major types of income payments received by individuals: payments in return for services of labour, payments in return for the use of capital, and payments made gratuitously or without reference to services currently rendered. Table I presents some of these figures for the United States in selected years.

The major part of total income payments to individuals took the form of salaries and wages paid to labour. Dividends, interest and net rents and royalties were capital return items and accounted in total for about one-

Table I.—*U. S. Income Payments to Individuals, by Type of Payment**
(000,000,000's of Dollars)

Type of Payment	1929	1933	1937	1939	1940‡
Total payments to individuals	$82.06	$46.83	$71.78	$70.10	$74.07
Salaries and wages†	52.29	29.12	45.29	44.41	46.95
Social Security benefits and other labor income	.94	1.04	1.22	1.69	1.84
Direct relief	.06	.58	.84	1.07	1.07
Entrepreneurial withdrawals	13.56	7.53	12.53	11.90	12.48
Dividends	5.94	2.19	4.75	4.12	4.71
Interest	5.91	5.16	5.04	4.86	4.90
Net rents and royalties	3.36	1.21	2.11	2.05	2.12

*U.S. Department of Commerce. †Including work-relief wages. ‡Preliminary.

sixth of aggregate payments in 1939 and 1940. Withdrawals by self-employed persons out of business earnings or capital also accounted for about one-sixth of total payments and represented return on invested capital as well as on the personal services of these entrepreneurs. Other amounts were small, relative to aggregate payments of all types, but provided the principal source of income for many persons who were unemployed and possessed no substantial amounts of personal capital.

The relative variability of the different types of income sometimes has been studied in order to determine if the income received by labour is curtailed or advanced to a greater or lesser extent than income received by owners of capital when total income declines or expands.

While dividends fluctuated considerably more than total income payments, interest was much more steady, and the sum of dividends, interest and net rents and royalties, indicative of return on invested capital, was equivalent to 18.5% of total income payments to individuals in 1929, 18.2% in 1933, 16.6% in 1937 and 15.8% in 1940. Salaries and wages, indicative of labour return, accounted for 63.7% of total payments in 1929, 62.2% in 1933, 63.1% in 1937 and 63.4% in 1940.

The apparent decline in the importance of capital return occurred in part because of the rise in importance of relief and benefits (from 1.2% of total payments in 1929 to 4.0% in 1940), in part because of declining rates of interest not completely offset by a small increase in the volume of indebtedness, and in part because of the naturally smaller yields on equity investments at the lower levels of capacity utilization prevailing in the later years. Salary and wage payments were sustained partly by work-relief wage payments; if these are deducted, other salaries and wages in 1940 accounted for 61.2% of total payments, compared with 63.7% in 1929.

Size-Distributions of Income.—Studies of income size-distribution usually are designed to determine at least the number of individuals or consumer-units receiving incomes of different amounts. There are several uses for such figures. Some of these are examined briefly below.

The increasing importance of personal income taxes as a source of government revenue accounts for some of the growing interest in size-distribution figures. Because the political forces at work generally have been such as to mould the income tax structure in such a way that tax rates on larger incomes are higher than the rates levied against smaller incomes, a clear analysis of income in terms of the number of recipients having different amounts is a significant tool in estimating anticipated revenues.

Another and a collateral development has been the growing political interest in the possible existence of cause-and-effect relationships between income size-distributions and certain economic problems of current interest. It is recognized quite generally that the pattern of income utilization differs considerably at different levels of income—that recipients of large incomes usually save a greater proportion of their aggregate income and that this tendency to save affects the relative demand for consumers' commodities and services on the one hand and for producers' goods on the other. The argument is, that money income generally must be converted into commodities and services in some form, that monetary savings out of large incomes may exceed the demands of the business community for new capital, and that a situation of idle funds may be created, resulting in unemployment of man power and of existing capital assets. An understanding of income size-distribution is, of course, basic to studies following such lines of reasoning.

It also is generally recognized that the character of consumer commodities and services utilized by income recipients differs between individuals at different income levels. So-called luxury items are purchased principally by persons with higher incomes, while staple products claim a

Table II.—*Size-Distribution and Utilization of Consumer Incomes in the U.S., 1935–36*
(In millions)

Income Level (Dollars per Year)	Number of Consumer-units	Aggregate Income	Income Utilization		
			Current Consumption	Gifts and Personal Taxes*	Savings
Total	39.46	$59,259	$50,214	$3,067	$5,978
Under $500	6.71	2,061	2,817	44	−800
500— 1,000	11.65	8,745	9,097	284	−636
1,000— 1,500	8.73	10,698	10,294	406	−2
1,500— 2,000	5.19	8,875	8,072	362	441
2,000— 3,000	4.44	10,577	9,043	465	1,069
3,000— 4,000	1.35	4,599	3,631	226	742
4,000— 5,000	.46	2,045	1,494	117	434
5,000—10,000	.60	4,092	2,604	270	1,218
10,000—20,000	.22	2,922	1,532	238	1,152
20,000 and up	.11	4,645	1,630	655	2,360

*Personal income taxes, poll taxes, and certain personal property taxes.

larger proportion of amounts going to recipients of smaller incomes. The number of consumer units at different levels of income thereby is an important factor in the determination of the market for particular commodities and services.

While income is not an ideal or comprehensive measure of welfare, the economic community is so organized that income size is a very important element in the whole pattern of individual and family well-being. Many other economic studies, therefore, have been directed toward the determination of minimum living standards, which standards always are expressed in terms of the level of income necessary to insure their maintenance. No standard has been or can be readily determined, but these investigations served to provide another source of interest in size-distribution estimates.

Comprehensive studies of income size-distribution have not, however, been numerous. The last significant analysis of this type was published by the National Resources committee under the title of *Consumer Incomes in the United States*. A companion bulletin, *Consumer Expenditures in the United States*, provides information on income utilization at different income levels. The figures refer to the years 1935–36 and were developed from income data for 300,000 consumer units (plus income tax data for the higher incomes) and expenditures data for 60,000 units. Selected information from these two studies is given in Table II.

In 1935–36 more than two-thirds of the nation's consumer units had incomes of less than $1,500 per year, and, in the aggregate, they paid out for current consumption, gifts and taxes considerably more than the amount of their income. In fact, nearly 80% of all expenditures for consumption were made by units with less than $3,000 per year at their disposal, although the same units received less than 70% of the total income.

Savings in the income group $1,500–$3,000 per year were slightly more than the excess of outlays over income by recipients of smaller annual amounts, and savings equivalent to about 10% of the aggregate income for all units were effected by the 7% of those units enjoying incomes of $3,000 or more per year. Income in excess of $10,000 per year received by all units having more than that annual amount was equal to about 7% of the total income for all groups, or about $9.00 per month for each consumer unit below the $10,000 level.

The ratio of outlays for gifts and personal taxes to total income in the different groups advanced with the level of income principally because of the importance of income taxes levied at higher rates against the larger incomes. It should be noted, however, that more than half of the total of gifts and personal taxes for all groups is accounted for by units receiving less than $3,000 per year. Actually the relative tax burden of the units at different income levels is not expressed clearly in these figures, because taxes levied in such a way that they are included in the prices of consumer goods are very important in the whole tax structure, but are not included in the tax outlays reported here.

Another recent study, one prepared for the Temporary National Economic committee under the title of *Concentration and Composition of Individual Incomes, 1918–1937*, provided figures illustrative of the changing proportion of aggregate income received by fixed percentages of income recipients (those receiving the highest incomes in each year). (*See* Table III.)

Concentration of income in the higher brackets appears to increase as total income experiences a cyclical expansion. This tendency is due in large part to the fact that recipients of large incomes receive a substantial proportion of their income in the form of return on invested risk-capital, or in the form of appreciation on such investments, and these types of income are much more variable than aggregate income of all types. The proportion of total income received by persons in the higher income brackets declines, largely for the same reason, when aggregate income decreases, and, over the 1926–37 span, there is no particular evidence in this study of a basic change in the degree of income concentration at the highest income levels.

State Distribution of Income Payments.—Income payments to individuals in the different states were estimated on an annual basis by the department of commerce. Variations between total and per capita incomes in the various states were substantial. In 1939, aggregate payments ranged from $88,000,000 in Nevada to $10,991,000,000 in New York, while per capita incomes (based on total population) ranged from $203 in Mississippi to $848 in Delaware. Figures of this type have been used to indicate the relative fiscal capacities of the different states and of the persons receiving their incomes therein. Data for 1939 are given in Table IV (estimates for 1940 will not be available before September 1941).

Distribution of Wealth.—No official estimates of national wealth or of its distribution have been made since the Federal Trade commission issued a report entitled *National Wealth and Income*, giving figures for the year 1926. The estimated value of national wealth there reported was $353,000,000,000. This figure compares with an estimate of $205,000,000,000 for 1912, but the increase over the ten-year period was influenced heavily by price advances, as well as by quantity additions to physical assets.

The Federal Trade commission also reported data on the values of 43,512 decedents' estates during the 1912–23 period. This study showed that 1% of the estates held 59% of the total wealth of all of the estates analyzed and that more than 90% of the assets of all estates was accounted for by about 13% of the estates. The data also tended to demonstrate a declining degree of wealth concentration over the period and a greater concentration in cities than in towns and rural areas. The sample of estates was very small, however, and it is unlikely that decedents' estates are entirely representative of the asset holdings of living persons, so the wealth-distribution significance of these figures is somewhat limited.

In the June 1927 issue of the *Journal of the American Statistical Association*, Dr. Wilford I. King gave estimates of the distribution of wealth among all property owners in the United States in 1921. He found that approximately half of the 41,000,000 property owners in that year (total population 108,000,000) owned assets worth less than $2,500 each, and, in the aggregate, accounted for less than 10% of the total national wealth. The 10% of property owners who held assets worth more than $10,000 possessed more than two-thirds of the total national wealth. The highest 2% of property owners claimed 40% of the total, and the highest 1% owned approximately one-third. (*See* also NATIONAL INCOME.)

(J. L. MA.)

Table III.—*Shares of Total Income Received by Selected Proportions of Income Recipients in the U.S., 1926–37**

(Aggregate Income in Millions)

Year	Aggregate Income†	Highest 2%	Highest ½ of 1%	Highest 1/100 of 1%
1926	$74,484	20.52	12.60	2.70
1927	74,654	21.54	13.51	3.02
1928	79,224	23.65	15.56	3.94
1929	81,050	22.84	14.89	4.00
1930	68,409	18.99	11.22	2.38
1931	54,288	18.51	10.19	1.88
1934	49,400	16.95	9.57	1.76
1934	50,028	17.41	9.86	1.75
1935	54,561	17.81	10.19	1.81
1936	63,943	18.83	10.17	1.97
1937	69,387	17.37	10.14	1.77

*Income defined as total income less business expenses. Second figure for 1934 and data for 1935–37 slightly overstated relative to earlier years due to change in income concept.
†Not identical with aggregates of income payments to individuals given in prior tables due to slight differences in concepts and methods.

Table IV.—*Aggregate and Per Capita Income Payments to Individuals in the Various States, U.S.A., 1939**

(Aggregate Income in Millions of Dollars)

State	Aggregate	Per Capita	State	Aggregate	Per Capita
Alabama	$ 686	$243	Montana	$ 304	$552
Arizona	225	456	Nebraska	552	421
Arkansas	472	244	Nevada	88	806
California	5,122	753	New Hampshire	254	519
Colorado	581	522	New Jersey	2,674	†
Connecticut	1,310	768	New Mexico	170	323
Delaware	222	848	New York	10,991	825
District of Columbia	790	†	North Carolina	1,068	302
Florida	843	457	North Dakota	231	362
Georgia	905	292	Ohio	4,181	608
Idaho	234	453	Oklahoma	797	343
Illinois	5,027	640	Oregon	591	545
Indiana	1,684	494	Pennsylvania	5,678	575
Iowa	1,128	446	Rhode Island	473	666
Kansas	739	411	South Carolina	508	268
Kentucky	847	300	South Dakota	239	373
Louisiana	820	350	Tennessee	856	296
Maine	404	481	Texas	2,558	401
Maryland	1,070	595	Utah	245	449
Massachusetts	3,035	705	Vermont	174	486
Michigan	3,123	604	Virginia	1,019	385
Minnesota	1,398	505	Washington	1,041	606
Mississippi	441	203	West Virginia	712	378
Missouri	1,782	472	Wisconsin	1,555	501
			Wyoming	152	623

*U.S. Department of Commerce. †Per capita not computed because of marked differences between residence and place of receipt of income.

Weather: *see* METEOROLOGY.

Welles, Sumner (1892–), U.S. undersecretary of state, was born Oct. 14 at New York city and was educated at Groton (Mass.) school and at Harvard. He was secretary of the U.S. embassy at Tokyo from 1915 to 1917, was stationed at Buenos Aires during the next two years, and in 1921 became chief of the Latin-American affairs division of the state department in Washington. In 1922 he was U.S. commissioner to the Dominican Republic, and in 1924 he was President Coolidge's personal representative in Honduras, then in the throes of revolution. He was appointed assistant secretary of state April 6, 1933, and except for a short period as ambassador to Cuba in 1933 held this office until his appointment May 21, 1937, as undersecretary of state.

A polished professional diplomat with a fine admixture of tact and firmness, Welles achieved renown in 1940 during his "mission of peace" to Europe. He began this trip with a visit to Mussolini at Rome Feb. 26, then interviewed in rapid succession Ribbentrop, Hitler, Goering, Hess, Lebrun, Daladier, King George VI and Chamberlain. Before sailing for home from Italy March 20 Welles declared that he had neither presented nor received any plans for peace. The results of his mission remained cloaked in official secrecy.

Wellesley College in Wellesley, Mass., founded in 1870 by Henry Fowle Durant, occupies 400 ac. of rolling woodland bordering on Lake Waban. A four year liberal arts college enrolling approximately 1,500, Wellesley is pre-

eminently for candidates for the B.A. degree, but offers also the degrees of Master of Arts, Master of Science, Master of Arts in Education and a certificate in hygiene and physical education. The 199 faculty members offered instruction in 26 departments ranging from art to zoology in 1940. Conspicuous among activities in 1940 were the work of the college war relief committee and the housing and care of 74 British refugee children in a college residence during the late summer. Trust funds were $10,535,-562.09; the value of the plant was $11,131,960.19.

(M. H. McA.)

West Africa, British: *see* BRITISH WEST AFRICA.

Western Australia. A state of the Australian commonwealth; area 975,920 sq.mi.; pop. (est. June 30, 1939) 465,431. Chief town: Perth (pop. Dec. 31, 1939—including Fremantle) 224,800. Governor: (vacant); lieutenant-governor: Sir James Mitchell, K.C.M.G.

History.—The biennial elections for the legislative council were held on May 11. Sir Hal Colebatch, former agent-general for Western Australia in London, defeated one of the two retiring members who failed to gain re-election.

In some pastoral areas of the state, drought conditions continued in 1940 for the fifth consecutive year. The drought had been responsible for a decline of 50% in flocks in pastoral areas and the government appointed a royal commission to investigate the financial and economic position of the pastoral industry. Agricultural prospects were good although the season's crop was not expected to reach the high figure of 40,000,000 bu. harvested in 1939–40. In an effort to increase the production of flax to meet urgent defence requirements the state department of agriculture guaranteed farmers a gross return of £4 per acre and the commonwealth government was equipping a retting mill in the southwest portion of the state.

Payment of state income tax by instalments deducted from salaries and wages was made compulsory as from Aug. 1.

The state accounts for the fiscal year 1939–40 revealed a deficit of £147,000 compared with an estimated deficit of £31,000.

Finance.—Revenue (1938–39), £A10,949,660; expenditure, £A11,170,102; debt outstanding (Dec. 31, 1939), £A96,534,460.

Communication.—Roads (June 30, 1938) 29,722 mi. fit for motor traffic; railways (1938–39) government 4,378 mi.; motor vehicles licensed (1938–39): cars 38,039; trucks 24,441; cycles 7,199. Wireless receiving set licences (June 30, 1939) 79,262.

Agriculture and Manufactures.—Production: wheat (1939–40) 41,500,000 bu.; wool (1939) 72,475,000 lb.; gold (1939) 1,214,238 fine ounces. Industry and labour (1939): factories 2,129; employees 23,211; gross value of output £A19,548,511; unemployment (trade union returns) (Feb. 1940) 6·9%.

(W. D. MA.)

West Indies, an archipelago lying between Florida and South America, and including the Greater Antilles (Cuba, Hispaniola, Puerto Rico and Jamaica, with lesser dependent islands) and the Lesser Antilles (extending from the Virgin islands to Trinidad); languages, Spanish, English, French and Dutch. The area is approximately 99,000 sq.mi. The population (estimated at roughly 12,400,000 at the end of 1940) is three-fourths white and one-fourth Negroid in Cuba and Puerto Rico and 80% to 99% Negroid elsewhere except in Trinidad, where it is 40% East Indian. The West Indies includes three republics, two United States dependencies, and six British, two French and one Netherlands colony. During 1940, the most important developments centred around the activities of the United States in developing defences in the archipelago and around the plight of the French colonies following the collapse of France in June. In normal times trade is chiefly with the United States and, in the European colonies, with their respective metropolises, but, under conditions prevalent in 1940, access to customary European markets and sources of supply was rendered difficult or else cut off altogether. In consequence, trade with the United States was stimulated. Imports are usually foodstuffs, textiles and manufactured goods; exports are sugar, chiefly, and other products of tropical agriculture, with Trinidad and Curaçao supplying petroleum products. Except in these two islands and in Cuba and Hispaniola, where there are undeveloped mineral deposits, resources are almost entirely agricultural. External communication is by sea, with Pan American Airways linking the main centres with other parts of America. The tourist trade is growing rapidly. (*See* also BAHAMAS; CUBA; CURAÇAO; DOMINICAN REPUBLIC; FRENCH COLONIAL EMPIRE; HAITI; HISPANIC AMERICA AND THE EUROPEAN WAR; PUERTO RICO; VIRGIN ISLANDS; WEST INDIES, BRITISH.)

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(L. W. BE.)

West Indies, British. The several British islands in the West Indies; language, English. Politically, the islands are administered separately or in groups as British crown colonies: Jamaica; the Leeward islands, a loose federation of the presidencies, or colonies, of Antigua, St. Kitts-Nevis, Montserrat, Virgin islands (British); Barbados; Trinidad and Tobago; and Grenada, St. Lucia, St. Vincent and Dominica, otherwise separate colonies, but collectively called the Windward islands and administered under a common governor, who usually resides at St. George's, Grenada. In Jan. 1940, under authority of an act of parliament of March 30, 1938, Dominica was transferred from the Leeward islands administration to that of the Windward islands. (*See* map p. 210.)

Each colony has a governor or other chief executive appointed by the crown (for names of governors, *see* BRITISH EMPIRE), an appointed executive council and a partially-elected legislative council or assembly. Barbados has a representative legislature but not full responsible government, and is the only colony electing a majority of its legislative body. Suffrage and officeholding are generally restricted by property qualifications.

Table I.—*Areas and Population of British West Indies*

Colony	Area (sq. mi.)	Pop. (1939 est.)	Capital (with est. pop.)
Barbados	167	195,548	Bridgetown (70,500)
Jamaica (including Turks and Caicos 116 sq. mi. and Cayman Islands, 140 sq.mi.)	4,846	1,186,017	Kingston (76,986)
Leeward Islands			
Antigua (including Barbuda, 62 sq.mi. and Redonda)	171	35,527	St. John's (10,000)
Montserrat	32	13,541	Plymouth (2,000)
St. Kitts-Nevis (St. Christopher, 68 sq.mi.; Nevis, 50 sq. mi.; Anguilla, 34 sq.mi.)	152	37,579	Basse-Terre (8,000)
Virgin Islands (British)	67	6,288	Road Town (400)
Trinidad and Tobago (Tobago, 116 sq.mi. pop. 29,082)	1,980	473,455	Port of Spain (89,550)
Windward Islands			
Dominica	304	51,951	Roseau (8,000)
Grenada (including Carriacou, 13 sq.mi., pop. 9,358)	133	90,085	St. George's (6,500)
St. Lucia	238	69,787	Castries (9,000)
St. Vincent (including the Lesser Grenadines)	150	59,683	Kingstown
	8,240	2,219,462	

History.—The main developments in West Indies history during 1940 centred about the recommendations of the royal commission on the West Indies as a result of its investigations in 1938 and 1939, and the British-United States agreement of Sept. 2, under which the United States was given naval and air-base rights in certain islands.

The West Indies royal commission (informally called the Moyne commission from its chairman, Lord Moyne), appointed

on Aug. 5, 1938, to investigate social and economic conditions in the West Indies, British Guiana and British Honduras, spent some months of investigation, and, on Feb. 16, 1940, a portion of its formal report was made public with its recommendations. Its main recommendations were for the establishment of a West Indies Welfare fund, financed by an annual grant of £1,400,000. In the field of social services, it urged improvement of educational facilities, the establishment of a unified health policy and betterment of housing conditions. Great stress was given to the acute problem of labour relations, with recommendations for a labour adviser, a system of wage boards and industrial courts, and consideration of unemployment insurance, improved factory regulations and workmen's compensation. In the economic field, the commission took cognizance of world overproduction of the West Indies' main agricultural products and the problem of increasing overpopulation, and after approving an increased sugar quota, gave qualified endorsement to government support of industrial enterprises. For agriculture itself, a centralization of agricultural policies and direction, and increase of agricultural education were recommended along with special soil surveys, and inquiries into various means of developing forms of agriculture best suited to the regions, with stress on the production of foodstuffs for local consumption, and development of a comprehensive land settlement program. Consideration was given to a proper communications policy. (See *Communications* below.)

The long-continued agitation for complete self-government based on universal suffrage was met by recommendation of political federation as an ultimate, but not immediate, end, with a greater actual participation of elected representatives and a substantial reduction in the qualifications required of elected members of legislative councils. Political federation, the commission felt, should first be given a practical test through merger of the Leeward and Windward islands administration, using the existing Leeward islands government as a model. Need for betterment of appointed administrative personnel was likewise stressed.

The Moyne commission's report was generally well received in both the United Kingdom and the West Indies, and its recommendations were the bases of the subsequent Colonial Development and Welfare act, passed by parliament in July. This act authorized sums for colonial research, and colonial development and welfare, with an immediate expenditure in the tropical American colonies of £350,000 through grants-in-aid, including £27,810 to the Windward colonies.

Sir Frank Stockdale, a veteran of colonial service, was appointed to the newly-created post of comptroller for development and welfare in the West Indies, and a single chief justice named for both the Leeward and the Windward islands as a tentative step toward eventual federation.

Of perhaps eventually equal importance to the West Indies was the development of a project under which the United States traded 50 destroyers to Great Britain for 99-year lease rights for naval and air bases in West Indian and certain other colonies. This was crystallized and formulated in an exchange of notes between the two governments on Sept. 2, under which Great Britain made available to the United States "for immediate establishment and use of naval and air bases and facilities for entrance thereto and protection thereof" sites on the western coast of Trinidad, in the Gulf of Paria, the southern coast of Jamaica, the western coast of St. Lucia and in Antigua (as well as certain sites outside the West Indies proper). These were leased to the United States free of all charges other than those necessary to compensate owners of private property.

Numerous United States naval and other officials, including Secretary of the Navy Frank Knox, visited the West Indies during the remaining months of the year, and, in Dec. 1940, President Roosevelt himself made a tour of inspection. Some difficulties were encountered in the selection of a site on Trinidad, regarded by many as the most important location of all. United States officials objected to allocation for an air and naval base of a swampy area which colonial officials preferred because of its isolation from heavily-populated districts, and final adjustment had not been made by the close of the year. The sites chosen included Portland bight, with an adjacent land area on the southern Jamaica shore; a seaplane base at Parham sound, on the northeastern side of Antigua; and a seaplane base at Gros Islet bay, St. Lucia, along with use of a large land area at Vieux Fort for a bomber patrol station. Preliminary work on the bases was begun immediately, and by mid-November United States naval patrols were operating from St. Lucia. Development of the four West Indian bases was estimated to cost a possible $70,000,000.

The several West Indian colonies made numerous contributions toward the successful prosecution of the war against Hitler, in man-power, especially aviation personnel, in money and other economic resources, and in caring for evacuees. Under the leadership of a prominent newspaper, private sources in Jamaica raised in excess of £40,000 for the purchase of bomber planes. The government of Trinidad made an outright gift of £500,000 and an interest-free loan of £520,000, while private citizens raised £72,000 (including a single gift of £10,000) for aircraft purchase. In Barbados, the government contributed £125,000 for general war purposes, private groups over £25,000. Similar contributions were made by the Windward and Leeward islands colonies. Jamaica became host in August to nearly 4,000 civilian evacuees from Gibraltar.

Communications.—External communication is by steamship service, and Pan American Airways to Jamaica, Antigua, Barbados and Trinidad. Interisland communication is, in several instances, poor. The Virgin islands are reached by way of the United States. The Moyne commission recommended subsidizing a British passenger service from the outside and establishing a small, government-operated or subsidized interisland line, as well as a regular air service from St. Kitts to Trinidad covering the principal intermediate islands.

Kingston, Port of Spain and Bridgetown are important ports of call. Only Jamaica, with 210 mi., and Trinidad, with 123 mi., have railways. Roads are adequate for local needs.

Agriculture.—With the exception of Trinidad, where petroleum (1940 est., 20,300,000 bbl.) and asphalt dominate economic life, and in Barbados, where some small undeveloped petroleum deposits exist, the British West Indies lack mineral resources. Agriculture, along with the processing of its products (especially sugar), is almost the sole basis of economy except in Trinidad. A wide diversity of agricultural commodities is produced, but sugar, bananas, cacao and cotton are the most important.

In 1940, 290,658 ac. were planted in sugar, and the 1940–41 crop was estimated to provide 449,909 tons for export (Barbados, 126,425; Jamaica, 133,800; Trinidad, 114,390; Antigua, 29,000; St. Kitts, 36,500; St. Lucia, 9,694; St. Vincent, 100). A large portion of the sugar output is processed into rum and molasses.

Over 97% of the banana acreage (76,022 ac.) is in Jamaica. In 1939 Jamaica was the world's leading banana exporter, shipping 18,771,628 stems (23,811,337 stems in 1938), nearly 90% to Europe, but under war conditions exports in the first 11 months of 1940 totalled only 6,656,520 stems, and practically ceased after Great Britain embargoed fresh fruit shipments in Nov. 1940.

Table II.—*Imports and Exports of the British West Indies, 1939*
(with percentages of trade with the United Kingdom, Canada, and the U.S.)

Colony	Imports	U.K.	Can.	U.S.	Exports	U.K.	Can.	U.S.
Trinidad and Tobago	$34,762,954	35.6	14.5	25.5	$37,481,438	41.5	9.8	4.8
Jamaica	£6,506,659	29.1	17.7	23.2	£4,764,746	40.7	13.1	11.8
Barbados	£2,445,753	35.4	17.6	15.9	£2,028,991	40.7	51.9	3.8
Grenada	£292,829	19.8	14.3	4.1	£310,687	33.4	13.8	2.0
St. Kitts-Nevis	£293,264	(not available)			£433,824	(not available)		
Antigua	£230,874	(not available)			£220,460	(not available)		
St. Vincent (1938)	£198,786	42.7	17.11	13.5	£210,642	39.8	7.7	35.3
St. Lucia (approx.)	£161,823	37.6	17.4	4.0	£117,201	24.6	37.9	3.8
Dominica	£109,594	37.6	20.0	14.5	£65,077	10.7	9.1	21.5
Montserrat	£49,301	(not available)			£54,540	(not available)		
Virgin Islands (1938)	£14,125	(not available)			£9,808	(not available)		

An area of 237,014 ac. is devoted to cacao (Trinidad and Tobago, 210,000 ac.; Grenada, 20,500 ac.). World overproduction is a serious obstacle to the industry, necessitating a quota system. In 1939 exports were: Trinidad, 7,479 tons; Grenada, 3,592 tons; Jamaica, 2,315 tons. Cacao comprised 4.5% of Trinidad's exports and 34.4% of Grenada's.

Coco-nuts (103,025 ac.) were important, especially in Trinidad and Tobago (52,500 ac.) and Jamaica (40,074 ac.). Jamaica led in their export, shipping 31,406,137 nuts in 1939, over 75% of the British West Indian total. St. Lucia, St. Vincent and Trinidad were next in export importance.

In 1939–40, 21,454 ac. were planted in cotton (mostly sea island). Production totalled 6,613 bales of 400 lb. (5,900 bales sea island), nearly 30% greater than in 1939 (St. Vincent, 1,775 bales; Montserrat, 1,500 bales; St. Kitts, 1,000 bales). Cotton made up nearly 80% of Montserrat's exports and 24% of St. Vincent's.

British West Indian coffee is mostly of a low grade. The "Blue Mountain" coffee of Jamaica, however, is one of the world's finest coffees. Jamaica produced 91.9% and Trinidad and Tobago 8% of the 9,090,635 lb. of coffee exported in 1939. In 1940, however, Trinidad's coffee exports more than doubled.

Citrus fruits, especially oranges, limes and grapefruit, are grown in most of the colonies, with 10,780 ac. in citrus groves in 1940 (1939, 8,970 ac.). Dominica, St. Lucia, Trinidad and Montserrat together accounted for most of the world's lime juice production. Limes and other citrus fruits (fresh or processed) made up 54% of Dominica's exports.

Fresh vegetables, notably tomatoes for the Canadian market, were extensively produced in the Leeward and Windward colonies. St. Vincent dominated world arrowroot production. The 1939 crop, 11,762,919 lb., an all-time record, accounted for 66.3% of the colony's export values.

Spices are important, especially in Grenada and Jamaica. Nutmeg (2,145 tons in 1939), mace and other spices made up a third of Grenada's exports. Jamaica was the sole source of pimento ("allspice"), exporting over 2,200 tons in 1939 and a heavy producer of ginger (1939 exports, 1,602 tons), but exports of both were halved in 1940.

Education.—In 1940 there were 1,338 elementary schools, with approximately 326,054 pupils in 1940, as well as secondary schools. Higher education is provided at Codrington college, near Bridgetown, Barbados, and at the Imperial College of Tropical Agriculture, at St. Augustine, Trinidad, one of the world's leading institutions of its kind.

Finance.—The monetary unit, except in Trinidad, was the pound sterling. The Trinidad dollar, officially valued at $4.80 to the pound (approx. 84 cents U.S. in 1940), was legal tender in both Trinidad and Grenada.

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(L. W. BE.)

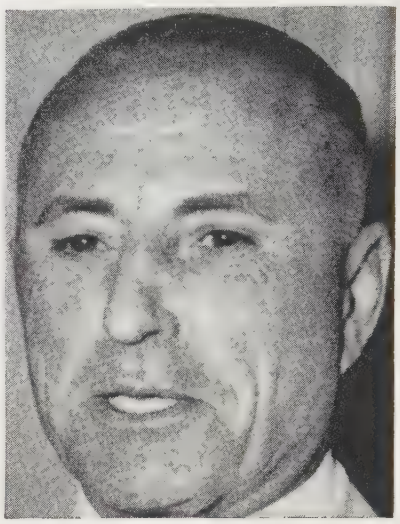
Westmark: *see* GERMANY.

West Virginia, a state in the Appalachian mountain region in the eastern part of the United States, sometimes called the "Panhandle State," was formed from Virginia during the Civil War and admitted to the union, June 20, 1863. It has an area of 24,170 sq.mi. Its population in 1930 was 1,729,205 of which 1,613,934 were whites (51,520 foreign born). Its total urban population was 491,504. Its population in 1940 was 1,901,974. Its capital is Charleston (pop. 67,914). Its other chief cities are Huntington (78,836) and Wheeling (61,099). It has about 4,000 mi. of steam railway, 182 mi. of electric railway and a new and extensive system of improved highways (over 12,176 mi.).

History.—The chief state officers in 1940 were: governor, Homer A. Holt; secretary of state, William S. O'Brien; treasurer, R. E. Talbott; auditor, Edgar B. Sims; attorney general, Clarence W. Meadows; commissioner of agriculture, J. B. McLaughlin; superintendent of schools, W. W. Trent. All except the governor were re-elected in Nov. 1940. M. M. Neely was elected governor. The official count of the election of 1940 showed that Roosevelt received 496,146 votes and that Willkie received 372,662 votes. For governor of the state the vote stood 496,028 for M. M. Neely and 383,698 for D. Boone Dawson.

Other state officials (Democrats) were elected by majorities ranging from 141,745 for secretary of state to 112,000 for commissioner of agriculture. For U.S. senator Judge Harley M. Kilgore received a vote of 492,413 and Thomas B. Sweeney received a total of 381,806.

Education.—Education is free in the public schools for all children between six and 20 years of age and is compulsory for all between seven and 16. The pupil enrolment in the 5,026 state elementary schools for 1939–40 was 312,640. In the 386 state high schools it was 140,181. The number of teachers was 11,061 in the elementary schools and 5,117 in the high schools. The total state appropriation for elementary and secondary education in 1939–40 was $14,073,765 (the general school fund, $773,785).



MATTHEW M. NEELY, new Democratic governor of West Virginia, elected Nov. 5, 1940

The state supports seven teachers-training colleges which in 1939–40 had a total student enrolment of 3,464 and a total instructional membership of 323, and received state appropriations amounting to $935,808. It also supports the West Virginia university which in 1939–40 had an enrolment of 4,221, a total faculty membership of 255 (besides 67 assistants and the staffs of the demonstration school, library, experiment station, extension, military and athletics) and a total income of $2,384,654.

Banking and Finance.—On July 1, 1940, the total deposits of the 104 state banks and trust companies were $142,706,065.42. The total deposits of the 78 national banks in the State were $170,520,000.

The summarized finance statement of the state treasurer for the fiscal year 1939–40 is as follows:

Balance July 1, 1939	(all funds)	$ 11,640,331.39
Receipts for 1939–40	(all funds)	106,637,894.28
	(transfers)	41,754,474.55
Total		$160,032,700.22
Disbursements, 1939–40		
(all funds)	$101,807,327.87	
(transfers)	41,754,474.55	
		143,561,802.42
Balance, July 30, 1940		$ 16,470,897.80

On July 1, 1940, the total state funded indebtedness was $77,232,000; the total amount of outstanding state road bonds was $73,982,000.

The total assessed value of all property in 1940 was $1,838,783,059 (real estate, $850,357,039; personal property, $397,668,520; public utilities, $590,757,500). The total federal tax was $13,143,541.11. This includes tax on capital stock, transfer of estates, and property transfers by gifts. The total federal income tax collected for 1939–40 was $10,965,842.88.

Industries.—In 1935 the oil production was 3,959,000 bbl. (which decreased to 3,847,000 bbl. in 1936 and 3,660,000 bbl. in 1937). In 1939 it was 3,587,000 bbl. and the natural gas production was about 150,000,000,000 cubic feet. In 1939 the coal production was 108,515,665 short tons and the coking operations produced an output of 80,310 tons. In 1937 the state had 2,654 reporting industrial establishments, which employed 243,257 persons and paid $320,760,285 in wages. These plants had a total production of about $983,352,477—indicating a considerable increase since 1931.

Agriculture.—The acreage, production and value of the chief farm crops during 1939 were as follows:

Acreage, Yield and Value of West Virginia Farm Crops in 1939

	Acreage	Yield	Value
Corn	491,000	13,994,000 bu.	$10,215,620
Wheat	145,000	2,002,000 bu.	1,891,800
Oats	73,000	1,460,000 bu.	671,600
Buckwheat	15,000	248,000 bu.	183,520
Hay	684,000	728,000 tons	6,988,800
Apples	. .	4,000,000 bu.	2,200,000
Potatoes	32,000	3,040,000 bu.	2,584,000

The number of farms by census of 1934–35 was 104,747 (acreage of 9,423,655), valued at $237,643,860.

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Weygand, Maxime (1867–), French soldier. For his biography, see *Encyclopædia Britannica,* vol. 23, p. 552. On May 19, 1940 Weygand was appointed commander in chief of the Allied armies to succeed Gen. Gamelin (*q.v.*), at the moment when the defeat of France was imminent. Dismissing 15 generals, Weygand planned a "defence in depth" in a vain attempt to halt the German onrush after the invaders had routed the Allied troops from Flanders. When Pétain replaced Reynaud as premier, Weygand was named minister of defence in the cabinet. Here he remained through the armistice negotiations until Sept. 6, when he was "relieved" of his cabinet post and sent to Africa to deal with the defection of various French colonies to Gen. Charles de Gaulle (*q.v.*). His failure to return to Vichy in the succeeding months gave rise to speculation that he himself had decided to aid the "free French," but he vehemently denied the allegation in an interview early in December.

The rumours nonetheless continued to persist.

Whaling: *see* FISHERIES: *Whaling*; EXPLORATION AND DISCOVERY.

Wheat. World production of wheat in 1940, exclusive of Russia and China, was estimated at 3,977,682,000 bu. as against 4,270,000,000 bu. in 1939. The U.S. crop in 1940 was 816,698,000 bu., about 9% over the 1939 crop of 751,435,000 bu. and above the ten-year (1929–38) average of 754,685,000 bu. The Canadian 1940 crop was a near record, 561,104,000 bu., compared to 489,623,000 bu. in 1939. A number of countries withheld, as military secrets, data on supplies and production of foodstuffs. Table I, showing world production of wheat is, therefore, made up of unofficial as well as official preliminary and final estimates. The figures are in all probability the most dependable that can be obtained since they are from the bureau of agricultural economics of the U.S. department of agriculture, with adjustments to include the higher later estimates of U.S. production.

Table I.—*World Production of Wheat in Major Areas, 1940 and 1939*

	1940 bu.	1939 bu.
North America		
United States	816,698,000	751,435,000
Canada	561,104,000	489,623,000
Mexico	13,000,000	14,771,000
Total	1,390,802,000	1,255,829,000
Europe, excluding Russia and Danube basin	1,060,000,000	1,263,000,000
Danube basin	300,000,000	453,000,000
Total, excluding Russia	1,360,000,000	1,716,000,000
Asia, excluding China	750,000,000	738,000,000
North Africa	125,000,000	151,000,000
Total, Northern Hemisphere	3,604,682,000	3,869,000,000
Southern Hemisphere		
Argentina	200,000,000	119,453,000
Australia	100,000,000	210,110,000
Union of South Africa	14,000,000	15,310,000
Total, Southern Hemisphere	314,000,000	344,873,000
World total, excluding China and Russia	3,977,682,000	4,270,000,000

A shortage of wheat, and other bread grains also, was general in Europe in 1940 owing to a poor season and the absence of imports. The Danube basin was short 153,000,000 bu. under the 1939 crop and it was estimated that no more than about 30,000,000 bu. of the 1940 crop would be available for export. The rest of Europe, outside of Russia and the Danube area, was short 203,000,000 bu. compared with 1939 production. Yugoslavia prohibited export of wheat in order to conserve the home supply. Although Russia has for several years published few production figures it was considered improbable that Europe could draw any 1940 wheat from Russia owing to a poor crop year in the U.S.S.R. Turkey prohibited export of wheat because of an insufficient 1940 harvest. No accurate figures have been available from China for several years, although China is a foremost producer of wheat.

Table II.—*Wheat Production by States, 1940 and 1939*

State	1940 bu.	1939 bu.	State	1940 bu.	1939 bu.
Kansas	123,848,000	111,657,000	Iowa	8,121,000	6,902,000
North Dakota	97,054,000	79,068,000	New York	7,996,000	6,382,000
Oklahoma	56,332,000	60,438,000	Maryland	7,566,000	7,352,000
Montana	56,070,000	51,473,000	North Carolina	6,132,000	5,100,000
Ohio	42,137,000	37,150,000	Kentucky	5,625,000	4,071,000
Washington	41,808,000	43,822,000	Tennessee	5,116,000	4,117,000
Illinois	40,155,000	41,472,000	Utah	4,861,000	3,989,000
Nebraska	34,821,000	36,376,000	Wyoming	3,410,000	2,812,000
Minnesota	32,069,000	22,108,000	South Carolina	2,688,000	2,415,000
Missouri	31,707,000	30,420,000	West Virginia	2,016,000	2,102,000
Indiana	30,147,000	27,612,000	Georgia	1,880,000	1,770,000
Texas	29,355,000	29,032,000	Wisconsin	1,743,000	1,350,000
South Dakota	26,221,000	18,990,000	New Mexico	1,720,000	3,782,000
Idaho	24,383,000	21,311,000	Delaware	1,400,000	1,296,000
Pennsylvania	18,789,000	19,421,000	New Jersey	1,316,000	1,170,000
Michigan	17,812,000	15,784,000	Arizona	819,000	805,000
Oregon	17,184,000	16,108,000	Nevada	483,000	412,000
Colorado	13,560,000	12,905,000	Arkansas	352,000	390,000
California	11,370,000	12,173,000	Maine	88,000	84,000
Virginia	8,463,000	7,685,000	Alabama	75,000	60,000

The 1940 wheat situation in North America was one of mounting carry-overs and increased production. In the United States the carry-over July 31, 1940, was 284,000,000 bu., and with the larger 1940 crop it was estimated that the 1941 carry-over would be about 118,000,000 bu. over normal, which is 250,000,000 bu. In Canada the carry-over July 31, 1940, was 300,741,062 bu. This with the large crop of 1940 gives a total Canadian supply of 861,845,062 bu. Exports, it was estimated, would take 180,000,000 bu. of this amount and Canadian consumption 130,000,000 bu., leaving a prospective carry-over July 31, 1941, of 551,845,062 bu. Owing to the huge supplies and to the restricted wartime markets in Europe, governments of the United States, Canada and other export countries took measures to aid wheat growers. The 1940 wheat crop year did not end in Argentina until the harvest that was finished in Jan. 1941. Stocks in Argentina were very low in 1940 owing to a huge reduction in acreage because of restricted export markets. Estimates of the crop harvested in Dec. 1940 and Jan. 1941 were 180,000,000 bu. to 200,000,000 bu., and it was believed that Argentina would have an export surplus of 100,000,000 bu. at the end of the crop year. Of this 38,000,000 bu. was earmarked for Brazil. Owing to drought the 1940 crop year production in Australia was placed at only 100,000,000 bu., with 45,000,000 bu. available for export.

The 1940 crop in the United States, Dec. 1 estimate, consisted of 227,547,000 bu. of spring wheat and 589,151,000 bu. of winter wheat; the 1939 crop, 181,694,000 bu. of spring wheat and 569,741,000 bu. of winter wheat; the ten-year (1929–38) average, 183,619,000 bu. of spring wheat and 571,067,000 bu. of winter wheat. Table II shows the estimated production, all varieties, by states, in 1940 and 1939. The seeding of winter wheat in the United States in the autumn of 1940, for harvest in 1941, was estimated at 46,271,000 ac. (*See* also CEREALS; FLOUR AND FLOUR MILLING). (S. O. R.)

Whisky: *see* LIQUORS, ALCOHOLIC.

White Russian S.S.R.: *see* UNION OF SOVIET SOCIALIST REPUBLICS.

Whitney Museum of Art: *see* SCULPTURE.

Wholesale Prices: *see* PRICES.

Wickard, Claude Raymond (1893–), U.S. secretary of agriculture, was born near Delphi, Ind. on Feb. 28.

After his graduation from Purdue university in 1915 he took over management of a farm near his birthplace. In 1933 he was appointed to the staff of the Agricultural Adjustment administration as assistant chief of the corn-hog division.

He advanced to chief of the division in 1935 and later became director of the AAA's conservation program for the north central states. On Feb. 1, 1940 he was appointed undersecretary of agriculture, and on Aug. 19, after the resignation of Henry A. Wallace (*q.v.*), President Roosevelt nominated him secretary of agriculture. Wickard declared after his nomination that he intended "to carry out the policies of Henry A. Wallace," his predecessor in the cabinet.

Wild, Horace B. (1879?–1940), U.S. airman, was born in Chicago and as a boy was interested in kites and balloons. He built an airship in 1905 and made many successful flights in gliders. He worked with Octave Chanute on his glider experiments in Indiana before he built his own. In 1905

he sailed in a balloon from Chicago to Lake Kiskisiak, N.S., 925 mi., and made a successful landing. He made about 1,800 flights, 75 of which were in Europe. He died in New York city, July 23.

Wild Life Conservation. A convention on nature protection and wild life preservation in the western hemisphere, drafted by a committee of experts from the 21 American republics, was approved and recommended for signature by the governing board of the Pan American union, as a result of the sessions of the Eighth American Scientific congress held in Washington, May 10 to 18, 1940. The convention, in 12 articles, provides for international agreements and co-operation "to protect and preserve in their natural habitat representatives of all species and genera of their native flora and fauna, including migratory birds, in sufficient numbers and over areas extensive enough to assure them from becoming extinct through any agency within man's control" and "to protect and preserve scenery of extraordinary beauty, unusual and striking geologic formations, regions and natural objects of aesthetic, historic or scientific value, and areas characterized by primitive conditions."

In conformity with the recommendation of the governing board the plenipotentiaries of six Latin American governments and the United States signed the convention at the Pan American union in Washington, Oct. 12. The Latin American signatories represented Cuba, El Salvador, Nicaragua, Peru, Venezuela and the Dominican Republic. Several other governments signified their intention to sign the convention, which would come into force three months after the deposit of not less than five ratifications with the Pan American union. Any contracting government might at any time denounce the convention by notification in writing addressed to the Pan American union, but no denunciation should take effect until the expiration of five years from the date of the entry into force of the convention. The convention, marking a long step forward, will supplement but not supplant the more formal treaties for the protection of migratory birds between the United States and Canada, and the United States and Mexico now in force.

Federal Aid to States.—The Federal Aid to Wild Life Restoration act (50 Stat. 917), known also as the Pittman-Robertson act, which became effective on July 1, 1938, justified expectations as a measure destined to be of incalculable benefit in building up the supply of game animals and game birds. The act authorized operating appropriations of not to exceed the annual revenue from the 10% tax on sporting arms and ammunition. This tax has yielded some $3,000,000 annually.

The initial appropriation under the act was $1,000,000; and for the fiscal year 1940 $1,500,000 was made available. Owing to expansion of the program the amount set aside by congress for federal aid was increased to $2,500,000 for the fiscal year 1941. Forty-three states had received approval for 310 projects up to June 30, 1940. Seventy-five of these projects are completed. The latest estimates of the migratory waterfowl population of the United States by the fish and wild life service indicate that it has doubled during the past six years, increasing from less than 30,000,000 in 1934 to more than 65,000,000 in 1940. Owing to the evidence of increase in ducks the 1940 open season for hunting was extended to 60 days. The daily bag limit of 10 ducks remained unchanged, but of geese, which apparently need more protection, was reduced from four to three. Losses of woodcocks during the unusually cold weather in the south last winter were severe, and for that reason the open season for these birds was reduced to 15 days. The new regulations became effective when approved by the president on recommendation by the secretary of the interior. (*See* also Bird Refuges; Fish and Wild Life Service.)

(E. A. G.)

Willkie, Wendell Lewis (1892–), Republican candidate for the presidency of the United States in 1940, was born Feb. 18 in Elwood, Ind., the son of Herman Francis Willkie and Henrietta Trisch Willkie. After graduating from the University of Indiana with an A.B. degree in 1913 he taught history in the high school at Coffeyville, Kan., attended Oberlin college for a short time in 1915, then became a laboratory assistant in a Puerto Rican sugar plant. In 1916 he received his law degree from the University of Indiana and joined his father's law firm in Elwood. On the day in 1917 that the United States entered the World War, Wendell Willkie enlisted; in France he became a captain in the 325th field artillery and after the armistice he continued in service to act as counsel for enlisted men who had been court-martialled. Meanwhile, on Jan. 14, 1918, he had married Edith Wilk of Rushville, Ind.

Back in civilian life, Willkie worked for a short time in the legal department of the Firestone Tire and Rubber company in Akron, O., then joined the law firm of Mather and Nesbitt in that city.

Among Willkie's legal clients was an Ohio utilities company, and through this relationship he was persuaded in 1929 to go to New York city as a member of the legal staff of Commonwealth and Southern, a large utilities holding company with operating units in 11 states. Four years later he was president of the company. In this $75,000-a-year office he more than doubled the amount of electricity sold by the company. He also entered into a controversy with the Tennessee Valley authority (which had set up extensive power developments in competition with Commonwealth and Southern) and attracted national notice and considerable sympathy for the cause of public utilities. Always ready to concede the need for proper control of utilities, he presented his arguments against excessive governmental regulation in such a logical manner that he became known, in the words of one publication, as the "most articulate" of the New Deal's critics, and, by 1939, as a potential candidate for president.

His nomination for the presidency by the Republican convention June 28, 1940, in the face of much opposition by regular politicians, was described as a "miracle." (For a fuller account of the campaign and the election, *see* Republican Party and Elections.) His campaign was an unusually active one. Although he was defeated by a substantial margin in the election of Nov. 5, the 22,333,801 votes cast for him exceeded the largest number ever cast for a presidential candidate except Franklin D. Roosevelt. After the election, Willkie retired to private life (he had resigned as president of Commonwealth and Southern) and issued a call to his followers to co-operate in national unity.

Wills, C. Harold (1878–1940), U.S. engineer, was born in Fort Wayne, Ind., June 1, and went to work in a machine shop when he was 17. He became chief engineer of the Boyer Machine company and was later employed by the Ford Motor company, becoming its chief engineer and manufacturing superintendent. He designed the Model T car and every other model of the company until 1919. He then began to build automobiles in his own plant. He died in Detroit, Dec. 30.

Windward Islands: *see* West Indies, British.

Wines. The disturbed conditions due to the war in the principal wine growing countries of Europe made it difficult, if not actually impossible to report satisfactorily on the wine vintages of 1940. France, the principal wine-growing country of the world, was largely under foreign military control and it was impossible to secure any authentic information regarding the success or failure of the 1939 vintages in Bordeaux, Cognac or the

Wine Production of the Principal Wine-Growing Countries of the World

In thousands of American Wine Gallons

1,000 American Gallons Equal 833⅓ British (Imperial) Gallons

Year	Approximate Production	Year	Approximate Production	Year	Approximate Production
	Algeria		France—Con.		Portugal
1936	302,557	1937	1,348,593	1936	97,335
1937	404,853	1938	1,520,085	1937	211,286
1938	587,737		Germany	1938	287,568
	Argentina	1936	110,643		Spain
1936	152,538	1937	89,775	1936	405,037
1937	208,320	1938	87,045*	1937	427,285
1938	243,120		Greece	1938	420,000†
	Australia	1936	45,543		Union of
1936	20,947	1937	88,410		South Africa
1937	16,196	1938	106,181	1936	40,188
1938	23,803		Hungary	1937	37,210
	Chile	1936	119,122	1938	42,813
1936	90,221	1937	117,416		United States
1937	93,082	1938	85,548		of America
1938	94,342		Italy	1936	57,828
	France	1930	953,452	1937	99,413
1930	1,102,788	1935	1,208,996	1938	70,665
1935	1,917,247	1936	883,155	1939	74,768
1936	1,036,875	1937	892,526	1940	101,064
		1938	1,252,545		

Source: From the *Annual* of the Office International du Vin 1940, the U.S. Tariff Commission, and the Wine Institute of California.
*Including Austria 22,391,200 gal. and the Sudeten 2,362,500 gal.
†Estimated production

Burgundy and Champagne districts. Even from that portion of France which was unoccupied, the information secured was meager and it was quite impossible to ascertain any details regarding either the quantity or quality of the wines harvested in the fall of 1940. The reports from Italy, second only to France in the extent of its wine production under normal conditions, were likewise meager. From such information as it was possible to secure, 1940 will have to be classed as an unsatisfactory year in point of quantity and in many instances also of quality.

From Bordeaux it was impossible to secure any reliable information, and whether any of the 1940 vintage will be available from Château Lafite, Château Latour, Château Margaux, Château Yquem or any of the other many choice wines of the Bordeaux section, time alone can tell. The conditions prevailing in the Burgundy district were likewise unknown. Millions of bottles of choice vintages of champagnes were taken from Reims and Epernay to Germany, either for eventual consumption there or perhaps to be used for trading purposes at the conclusion of the war.

From the Mediterranean coast of France, which was in the unoccupied zone, the information secured showed that the wine harvest in that part of France varied considerably in point of quantity, none however reaching the normal average, while on the other hand, the quality appeared to have been very satisfactory.

From Spain which finally emerged from its own civil war, it was learned that conditions, at least in the wine growing sections, were becoming more settled. However, because of heavy rains up to the end of June, the vines in southern Spain suffered heavily from mildew and the vintage in some districts was a failure. On the other hand, other sections of Andalusia where sherries are grown, fared somewhat better, but the small quantities produced with a growing demand for export requirements, greatly increased the prices on all grades. Catalonia in the northeastern section of Spain, reported an excellent wine crop for 1940 in respect to both quantity and quality. As a result of favourable atmospheric conditions, the grapes ripened well and the wines look very promising.

In Portugal the weather during the early part of the year was favourable, but rains in April and May, followed by a period of great heat in the summer and early fall made considerable inroads on the crops. However, on the whole, the vintage, while uneven, was satisfactory. The production of port wines for 1940 fixed by government control was 40,000 pipes of wine, precisely the same as in 1939; the balance produced being used largely for the distillation of brandy. The port wine market of course suffered as a result of the loss of Norway, Sweden, Holland, Belgium and France, all of which were important outlets for its products, its principal markets being Great Britain, Canada and the Americas.

The Madeira islands, because of unfavourable weather in spring and early summer, and the failure on the part of some growers to treat their vines properly, produced only 12,000 to 14,000 pipes of wine in 1940 against 20,000 pipes in 1939, 17,000 in 1938 and 20,000 in 1937. Those growers who treated their vines properly were well compensated for their labour by the excellent qualities of the year's vintage in the Madeira islands.

From Italy and Germany, no authentic reports were obtainable, and except for Greece and Hungary, the rest of Europe is of little importance so far as wine production is concerned.

Algeria, a French colony, was the only country in Africa producing substantial quantities of wine. The product of that country is wholesome and sound, and the quantities are reported this year as satisfactory.

United States.—The vintages in 1940 in California were the largest since the repeal of national prohibition in Dec. 1933. The California crop was estimated at approximately 95,000,000 American gallons, and the total wine production in the U.S.A. was well over 100,000,000 gallons.

Since the conditions of soil and climate in the United States do not vary as sharply from one year to another as they do in Europe, the quality of the grapes from year to year is fairly uniform. However, decided improvements were made in the methods of wine production and it was believed that American wines, largely because of the present European conditions, would take a more prominent place than ever before.

South America.—In South America, the Argentine republic and Chile are the principal wine producing countries, but due to the fact that they are below the equator, their wine crops are gathered in the spring. The 1940 wines showed a higher alcoholic content than in normal years.

Germany was, prior to 1940, the principal buyer of South American wines. The interruption of this traffic of course reduced the export of these wines and made it advisable for both countries to seek other markets.

Africa and Australia.—The Union of South Africa and Australia both produced wines in fairly substantial quantities, but the lack of shipping opportunities due to the war greatly impaired their export business and left large quantities of the 1939 and 1940 production undisposed of in the countries of origin.

In brief, 1940 will go down in history as an uncertain and on the average, an unsuccessful vintage year. In some countries the harvests were fairly satisfactory, but on the whole, the outlook for 1940 wines was unfavourable and 1937 will still have to be depended upon, so far as the wines of that year are obtainable, for vintages of really outstanding quality.

(A. Wi.)

Wisconsin, a north-central state, the 30th state to enter the union and the fifth and last to be created under the Ordinance of 1787, is known zoologically as the "Badger State." It has an area of 56,066 sq.mi. and the population, census of 1940, was 3,137,587, making it number 13 in rank among the 48 states. The increase in ten years was 6·8%. The capital is Madison, population (1940) 67,447. Estimated number of males 21 to 35 years of age, 387,000. Of these, Milwaukee, the metropolis, has 87,300 in a total population of 587,472 against 578,249 in 1930. In 1930 the rural population, 1,385,163, contained only 866 Negroes and 10,716 of "other races," which means Indians settled upon reservations. Native whites of native parentage constituted 44% of the whole rural element, native whites of foreign parentage 40·5%. Urban society showed 35·7% native whites of native parentage against 43·4% native whites of foreign parentage. The foreign-born made up 20·4% of urban, 14·8% of the rural population.

History.—In the presidential election Roosevelt (Dem.) received 704,821 votes, Willkie (Rep.) 679,206, Thomas (Soc.) 15,071, Browder (Comm.) 2,394, Babson (Proh.) 2,148, Aiken (Soc. Lab.) 1,882. The 11 electoral votes of Wisconsin were given to Roosevelt by a smaller majority than in 1936 and 1932. Robert M. La Follette, Jr., (Prog.) was returned to the United States senate by a plurality vote, his Republican opponent, Fred M. Clauson, trailing by some 45,000 and the Democratic contender being left far behind. In the three-cornered race for the governorship the Republican incumbent, Julius P. Heil had the plurality, Orland S. Loomis, the Progressive candidate running second and Francis E. McGovern, Democrat, third. Again, as in the session of 1939, the Republicans would control both houses of the legislature, but by more impressive majorities.

Hygiene and Corrections.—The 1937 legislature carried out the governor's recommendations in changing a number of three-man commissions to departments each with a director. Sub-directorships were then created to care for divisions of the departments, all responsible to the director. The public welfare department has six such divisions. On the whole, experience under this reorganization has been satisfactory, the only serious criticism of it being that directors under the law are not subject to civil service regulations. Selection of sub-directors, in most cases, has given satisfaction to citizen groups most closely identified with the work of the divisions.

A change in the law respecting the university board of regents, which permitted the governor to reconstitute that important board, was criticized at first as bringing the university into politics, but by Jan. 1, 1941 there was no evidence that the new board was concerned with matters other than the purely educational. The reorganization was brought about on the argument that Governor Philip F. La Follette had "packed" the board for the purpose of removing the then president, Dr. Glenn Frank. That board, however, appointed Dr. Clarence A. Dykstra to the presidency and he had the cordial co-operation of the new board.

Agriculture, Manufacturing and Mining.—Wisconsin's 200,000 farms averaged approximately 117 ac., the most numerous classification being that between 70 and 99 ac., the least numerous

that of 1,000 ac. and over. Of the latter there were, in 1935, only 131, of the former, 49,332. There were 2,060,000 cows on the farms, producing in 1938 an average of 5,700 lb. of milk, the aggregate being 11,862,000,000 lb. In 1939 this aggregate was 11,973,000,000 lb. Wisconsin stood first among the states in aggregate amount of milk, also in the amount of cheese products. All cattle on farms, Jan. 1, 1940, were valued at $195,238,000 as against $183,867,000 one year earlier. (*See* also ALFALFA; APPLES; BARLEY; BEANS, DRY; BUCKWHEAT; CORN; GRAPES; HAY; OATS; POTATOES; TOBACCO; WHEAT.)

All coal, petroleum, pig-iron, copper, asphalt, sulphur, salt, phosphate, glass and rubber used in Wisconsin industries were imported, but there was some production of crude zinc, copper and iron. In manufactures the state was ranked 11th in the union. There were 2,347 factories employing seven or more workers, but one-fourth of the factories employed three-fourths of the workers. Machinery, motor vehicles and paper production led. (*See* FARM MACHINERY.)

Labour Relations.—Certain features of the 1939 labour relations act were upheld by the state supreme court, but the opposition to the act on the part of union labour did not subside and other legal contests are promised. The new board reported that labour disputes were fewer than before the reorganization. In the year ending June 30, 1940, the board settled 178 controversies affecting 31,983 workers as against 847 cases brought before the old board in the period of 19 months from May 1, 1937 to Nov. 30, 1938. Requests to the board for assistance came equally from unions and from employers. (J. Sc.)

Wisconsin, University of.

Regular session enrolment (1940–41) totalled 11,397, about the same as the preceding year, making Wisconsin the eighth largest university in the U.S. Total enrolment, including both regular and summer session, extension and short course registrations, reached a new high of 47,773 in the year.

The university was projected into the national defence program during the year. Its president, C. A. Dykstra, was lent to the federal government to act as director of the nation's first peacetime selective service law, under which about 3,500 of the university's men students were registered. A faculty committee for research on national defence drew up and filed with the national defence research committee in Washington, D.C., a 300-page report outlining research projects, personnel and facilities available at Wisconsin which would be helpful in the U.S. defence program. The university also co-operated with the federal government's Civil Aeronautics authority, with 750 students enrolled in its pilot-training courses during 1940–41.

A new law library building, the four-story McArdle Memorial cancer research laboratory, and a five-unit dormitory housing 450 women students were new buildings completed and put into use on the campus during the year. Plans were also made for new chemical and electrical engineering buildings, a dairy building, and a new dormitory for farm short course students.

The largest number ever to graduate from Wisconsin in the university's 91-year history, more than 2,000 young men and women received their first and higher degrees at the school's 87th commencement in June. (R. Fs.)

Wolfe, Humbert

(1885–1940), British poet and playwright, was born in Milan, Italy on Jan. 5 and was educated at Wadham college, Oxford. He entered the civil service in 1908 and rose to the post of deputy secretary of the ministry of labour. His first publication was a volume of sonnets in 1920. He published many other volumes of verse and wrote literary criticism and plays. He was made a Companion of the Bath in 1925 in recognition of his literary achievements. He died in London, Jan. 5. *See* also *Encyclopædia Britannica,* vol. 23, p. 696.

Woman's Christian Temperance Union.

The fact that more than 32,500 women joined the organization in 1940, that similar increases were made in the two branches, the Youth's Temperance council and the Loyal Temperance legion, is warrant that there was increasing interest in the organization's work that year. One thousand and ten new unions were formed, which means that many new centres to work out the objectives sought—total abstinence from alcoholic beverages, and the abolition of the liquor traffic. The five seminars on alcohol education sent 50 trained specialists into teachers' colleges. Three motion pictures were in circulation. These dealt with the scientific, social and economic effects of alcohol. They were on high school and adult levels. Film strips for classroom use in the grades, dealing with health, safety and economics, were available. Exhibits and many varieties of visual demonstrations were but a few of the special features of the year. The weekly magazine, *The Union Signal,* a journal of social welfare, and the *Young Crusader,* a children's paper, were increasingly added to libraries, both public and school. Books and pamphlets were printed in excess of any other year.

The great contribution of 1940 to the educational program of the organization was the erection of a building to house the expanding library on alcohol research as a centenary memorial to Frances E. Willard.

The national officers in 1940 were: Mrs. Ida B. Wise Smith, president; Mrs. D. Leigh Colvin, vice-president; Mrs. Anna Marden DeYo, corresponding secretary; Mrs. Margaret C. Munns, treasurer; and Mrs. Nelle G. Burger, recording secretary. National headquarters, Evanston, Ill. (I. B. W. S.)

Women's Clubs, General Federation of.

The General Federation of Women's Clubs was organized in New York city in 1890. Sixty-one clubs were represented. Today the federation embraces 15,000 clubs with a membership of 2,000,000 women, including 85 clubs in 32 territories and foreign countries. The organization was granted a charter by the United States government in 1901.

Among activities of 1940 were: a two-months' good neighbour tour to South America; continued study of South American republics; study of "the purposes of education in American democracy"; development of a platform for consumer-business relations; a weekly consumer broadcast and a bi-monthly radio program, "Echoes of History"; promotion of public health projects; co-operation with the White House conference on children in a democracy and the National Defense council.

"Adjusting Democracy for Human Welfare" is the theme of the incumbent administration. The officers for the term 1938–41 are: Mrs. Saidie Orr Dunbar, president; Mrs. John L. Whitehurst, first vice-president; Mrs. LaFell Dickinson, second vice-president; Mrs. Horace B. Ritchie, recording secretary; Mrs. J. L. Blair Buck, treasurer. The federation owns its headquarters at 1734 N Street, N.W., Washington, D.C. (S. O. D.)

Wood, Robert E.

(1879–), U.S. soldier and business executive. He was born June 13 at Kansas City, Mo., graduated from West Point in 1900 and saw active service in the Philippines during the next two years. From 1905 to 1915 he was assistant chief quartermaster and chief quartermaster and director of the Panama Railroad company during the construction of the Panama canal. He left the army to engage in

private business in 1915 but returned upon the United States' entry into the World War in 1917 and was promoted to brigadier general. In 1918 and 1919 he was acting U.S. quartermaster general, and in the latter year he re-entered business as vice-president of Montgomery Ward & Co. in Chicago. He was vice-president of Sears, Roebuck and Co. in Chicago from 1924 to 1928, president from 1928 to 1939, then chairman of the board.

General Wood, who supported Roosevelt in 1932 and 1936, parted ways with the new deal in 1940 because of the administration's foreign policy. Believing that "all-out" aid to Britain would weaken U.S. defences and threaten to involve the nation in war, he organized the America First committee to oppose the U.S. intervention in the European conflict.

Wood, Spencer Shepard (1861–1940), U.S. naval officer, was born in Brooklyn, N.Y., Aug. 7, and was graduated from the United States Naval academy in 1882. He was promoted through various grades until he reached the rank of rear admiral in 1917. In 1894 he was sent to the Hawaiian islands by President Cleveland to investigate conditions with a view to the recognition of their government. He served as executive officer or commander of various warships and as commander of a fleet. He received the navy cross and several medals. He died in New York city, July 30.

Wool. Estimates of sheep in the world during 1940 were figured at 740,000,000, growing 4,010,000,000 lb. of wool. The Australian clip was computed at 1,036,000,000 lb.; South America, 606,000,000 lb.; United States, 487,000,000 lb.; New Zealand, 330,000,000 lb.; Union of South Africa, 261,000,000 lb. United States imports of apparel wool totalled 158,500,000 lb. in the first ten months compared with 72,000,000 lb. during the same period in 1939. As of Nov. 30, the U.S. domestic mill consumption of wool amounted to 605,000,000 lb., compared with 624,216,000 lb. for the 11 months in 1939. It is estimated that 160,000,000 lb. of grease wool were required, solely for the U.S. army, in orders placed from June 1 through October for defence purposes. The bulk of these U.S. orders specified the use of wools grown in the United States, but on Nov. 7 invitations for future bids were on three bases: all domestic wool; part domestic part foreign; all foreign. Due to conditions in the warring nations, it was impossible to secure accurate figures as to their wool consumption.

In Sept. 1939 the government of the United Kingdom purchased the entire Australian and New Zealand wool clips for the duration of the war and one year afterwards. In Sept. 1940 the wool clip in Cape Colony was placed under similar control. The British control board allocated in Dec. 1939, 75,000,000 lb. of Australian wool to the United States of which, to Nov. 30, 1940, 51,000,000 lb. were purchased. On Dec. 9, 1940 the British Wool Control board requested the Australian Central Wool committee to suspend the allocation for sale to any country, including the U.S.A., of wools below 66s quality and good topmaking fleece types unless containing more than 4% burr. This temporary suspension was caused by shortage of these wools in the United Kingdom.

On Dec. 10, 1940 details of the agreement between the United States and Great Britain for the acquisition by the United States government of a stock pile of 250,000,000 lb. of Australian wool to be held in the United States as a strategic reserve against possible emergency shortage of wool in the United States, were made public by the state department in an exchange of notes between Lord Halifax, British foreign secretary, and the American chargé d'affaires at London. Under the agreement the wool is to be transported to the United States and stored in bonded warehouses. The cost of transportation, on British shipping lines, is to be met by the United States, the United Kingdom retaining title to the wool. All or any part may be purchased by the United States or sold in the United States domestic trade upon a determination that an emergency shortage of wool exists. The agreement also provides that the United Kingdom may withdraw wool from the reserve if needed in case of shortage in empire territories or interruption of wool textile production in the United Kingdom for the manufacture of textiles in the United States to meet the United Kingdom emergency textile requirements, provided the reserve in the United States is temporarily depleted at no time more than 20% by such withdrawals. The strategic reserve is to be composed of 270,000 bales 58s/60s; 480,000 bales of 60s and finer; balance to be 60s and finer of good to average Bradford styles; two-thirds of all the 60s and finer wools to consist of 64s/60s.

The price of 64s/70s Australian wool averaged 63 cents clean cost in bond with U.S. territory fine staple at 94 cents scoured basis during 1940. The first sales by auction in Boston, Mass., of domestic wools were held during October at which time 4,428,125 lb., or 94% of the offerings, were sold at an average price of 32.62 cents a pound. Sales of wool top on the New York Wool Top Exchange to Dec. 1, were 150,450,000 lb. compared with 109,100,000 lb. for the same period in 1939. At the close of the year the total stock of apparel wool on hand in the United States was estimated at 324,000,000 lb. in comparison with a normal carry-over of 359,000,000 lb.

The Wool Products Labelling act of 1939 was passed by both houses of congress and signed by President Roosevelt to become effective as of July 14, 1941. After that time merchandise containing wool must be labelled, showing the percentage of the total fibre weight which is represented by wool; reprocessed wool; re-used wool; each fibre other than wool, if 5% or more; aggregate of all fibres other than wool; weight of any non-fibrous "loading," "filling" or "adulterating" matter. (*See* also TEXTILE INDUSTRY.) (C. M. AN.)

Work Projects Administration. The table shows employment on projects financed by WPA, 1938–40. The sharp decline in Aug. and Sept. 1939 was due to the heavy layoffs forced by the new law. In July 1939 there were laid off 342,157, and in August 678,621. The effect of increased employment due to European war orders and the U.S. defence program, began to appear in the figures given for 1940. Howard O. Hunter was in 1940 the acting commissioner.

Employment on Projects Financed With WPA Funds, United States and Territories, by Month, 1938–40

Month	Number Employed on Projects 1938	Number Employed on Projects 1939	Number Employed on Projects 1940
January	1,900,625	2,895,125	2,203,000
February	2,075,492	2,955,022	2,293,000
March	2,445,415	2,882,722	2,204,000
April	2,581,897	2,629,314	2,125,000
May	2,678,223	2,457,901	1,963,000
June	2,806,931	2,420,741	1,734,000
July	2,966,832	2,143,659	1,639,000
August	3,085,762	1,778,149	1,684,000
September	3,136,505	1,719,870	1,692,000
October	3,253,623	1,825,722	1,766,000
November	3,193,658	2,023,551	1,799,000
December	3,002,241	2,109,000	1,859,000

(*See* also ARCHAEOLOGY; EDUCATION: *Nursery Schools;* ILLITERACY; RELIEF.)

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World Commerce: *see* INTERNATIONAL TRADE.

World Council of Churches: *see* CHRISTIAN UNITY; RELIGION; CHURCH OF ENGLAND.

World's Fair, New York: *see* ARCHITECTURE; ART GALLERIES AND ART MUSEUMS; ELECTRIC LIGHTING; FAIRS, EXHIBITIONS, EXPOSITIONS.

World War II: *see* EUROPEAN WAR.

Wrestling Amateur wrestling continued to progress in the colleges, schools and clubs, and what was once professional wrestling continued to lose the interest of spectators. There was a move under way to establish honest wrestling in Madison Square garden, New York, under the Australian plan, which calls for ten-minute rounds, with a judge and a referee to award points. A fall would count much the same as a knockout would in boxing. The national A.A.U. wrestling championships, held at Iowa State college, Ames, Ia., attracted 90 of the leading wrestlers from every section of the United States. The team title for the total of nine weights was awarded to the West Side (N.Y.C.) Y.M.C.A., displacing the New York A.C. team, winners of the previous annual fixture and defeating the Baltimore Y.M.C.A. by one point. The National Collegiate Athletic association team title was won by Oklahoma A. and M. The Aggies scored 24 points, 10 ahead of Indiana, with Michigan third with 10 points. Lehigh won the eastern crown. (J. B. P.)

Wyoming, a Rocky mountain state, was admitted to the union July 10, 1890, as the 44th state. Leadership in the extension of rights to women gave it the name "Equality state." Wyoming has a land area of 97,548 sq.mi. The state is second in average elevation with approximately 6,700 ft.

According to the 1940 census, it had a population of 250,742, representing an increase of 11.2% in ten years. The capital city, Cheyenne, remained the largest city, with a population of 22,474.

History.—Elective state officials in 1940 were: governor, Nels H. Smith (R.); secretary of state, Lester C. Hunt (D.); auditor, William Jack (D.); treasurer, Mart T. Christensen (R.); and superintendent of public instruction, Miss Esther Anderson (R.). The Republican party had control of administrative boards. The legislature did not meet in 1940, although there were efforts to secure the call of a special session for the purpose of appropriating relief funds.

In the November general election the Republicans retained control of the state senate, but were forced to take a position of equality in the state house of representatives, since 28 Democrats and 28 Republicans were returned. The state voted Democratic in the national election, giving Roosevelt 59,287 votes; Willkie 52,633; Babson 172; Thomas 148. Senator J. C. O'Mahoney was re-elected to the U.S. senate with the largest majority ever given a Wyoming candidate—more than 19,000—despite the fact that his Republican opponent, Milward Simpson, carried on one of the most active campaigns in the state's history. In the congressional election John J. McIntyre (D.) defeated Rep. Frank Horton (R.). Many celebrations were held in July in honour of Wyoming's 50th year of statehood.

Education.—The University of Wyoming, the only institution of higher learning in the state, had a 1940 fall quarter enrolment of 2,110. The university was granted a charter of Phi Beta Kappa. A comptroller was named to assume the financial and business management of the university. High school attendance in the fall of 1940 was 15,080.

Mineral Production, Ranching, Manufactures, Agriculture.—Principal producing agencies of the state turned out products worth $262,000,000, representing an increase of more than $20,000,000 over the production of the same industries in 1939. Mineral production ranked first with approximately $173,395,000. Of this petroleum was valued at $152,420,000. Coal production was valued at $16,000,000; iron, $3,000,000; bentonite, $1,500,000. Petroleum production was nearly 27,000,000 bbl., an increase of almost 4,000,000 bbl. over 1939.

Livestock production was second with a value of $44,195,000. Wyoming cattle sold for $19,000,000; sheep, for $11,000,000; wool, for $10,000,000; horses and mules, for $1,000,000; and hogs, for $600,000. The value of livestock production showed an increase of 30% over 1939.

Manufacturing, excluding oil refining and dairying, produced goods valued at $25,000,000. Principal products were timber products, metal products, souvenirs, beverages and sugar.

Despite drought conditions in some sections of the state, Wyoming's major agricultural crops showed gains in production ranging from 5% to 53% over 1939. Alfalfa hay increased 12% to 598,000 tons. Wild hay increased 29% to 207,000 tons. Bean production increased 32% to 605,000 hundred-pound bags. Sugar beet production increased 18% to 634,000 tons. Potato production rose to 2,400,000 bu. Production of alfalfa seed rose from 68,000 bu. to 104,000 bu. The corn crop increased 9% to 1,930,000 bu. Wheat and oats production increased more than 20%.

It is estimated that close to 400,000 tourists visited Wyoming in 1940 and spent more than $25,000,000. Hunting and fishing were popular, although low water limited fishing and lack of snow in the fall of 1940 made big-game hunting difficult. (A. T. L.)

X-Ray. Much attention was given during 1940 to developments in the fields of military and naval medicine and surgery.

During the War of 1914–18 literally hundreds of methods were used for localization of foreign bodies in the tissues by means of the X-rays. Only a few of these methods stood the tests of practical use with portable apparatus in mobile hospital units. One in particular, the "Strohl" method, was that finally adopted by the United States army. One adaptation of this method was incorporated in the portable apparatus adopted by the medical department of the United States army for use in any active service in the near future. The new portable X-ray apparatus already under construction in considerable numbers is light in weight, readily transportable, capable of withstanding hard usage, and adaptable to conditions in all types of army hospitals including the surgical mobile unit. In addition to all types of diagnostic work both by fluoroscopy and films, the apparatus can be used for the treatment of inflammations and wound infections.

The value of the X-ray in the examination of the chest is so thoroughly established that the importance of X-ray examination of the chests of everyone inducted into the military service is universally recognized. The Canadian medical service carried out such an examination during 1939 and 1940 for every soldier at time of enlistment, using for that purpose a single 14x17 in. film. The cost of such an examination for the large number of men to be inducted into the United States service would be very high if 14x17 in. films were used. Such films would also present a difficult storage problem.

The medical department of the United States army adopted a method for chest examinations which depends upon photographing the chest image on the fluorescent screen. The picture is obtained on a 4x5 in. film which is readily filed as a permanent part of the soldier's record. The advantages of this method are its low cost (about 1/10 that of the 14x17 in. film), very high diagnostic accuracy, readability without enlargement or projection, low storage requirement and availability of conventional developing equipment. The only disadvantage is the first cost of the equipment which would be more than compensated by the savings in examination of large numbers of men. It is estimated that the equipment would last at least ten years.

The medical department of the United States navy adopted a similar but different method which also depends upon photographing the image upon the fluorescent screen. The film, however, is only 35 mm. in size. This has the lowest cost of any method (perhaps about 1/50 that of the 14x17 in. film). Its advantages are ease and convenience of storage, equipment readily available and not expensive, and processing facilities universally available. The only disadvantage is the necessity for use of a projection apparatus to view the film.

The use of the X-ray for the treatment of localized inflammations is now well established. It is of definite worth in the treatment of carbuncles, boils, localized cellulitis, acute parotitis following surgery and many other infectious conditions. There are numerous reports to indicate the value of the X-ray in treatment of gas gangrene and as a prophylactic against infection in war wounds. It also has a place in treatment of keloids and contractures following healing of wounds. (*See* also DENTISTRY; HEART AND HEART DISEASES; PHOTOGRAPHY: *Applications;* STANDARDS, NATIONAL BUREAU OF; TUBERCULOSIS.)

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Yachting. Although during the yachting season of 1940 war clouds did not come close enough to American shores to affect materially the number of boats in commission and in competition, their shadows did change considerably the com-

plexion of what have been in former years outstanding events. In Europe, of course, organized yachting activity had been suspended "for the duration." This affected the American scene by all but wiping out the major events with a distinctly international flavour.

The usual winter races for ocean racing craft from Florida ports to Nassau and Havana brought out good fleets, and a team of International class sloops from Long Island sound made an unsuccessful bid for the Amorita cup in a series of team races in Bermuda in April but these could hardly be called major events.

The war washed out the regular biennial ocean race to Bermuda and in its place the Cruising Club of America conducted a 455-mi. contest which started at Block island and took the fleet eastward and northward to Nantucket lightship, Mt. Desert rock off the Maine coast, and thence to the finish at Gloucester, Mass. The fleet was small and the weather encountered was decidedly wet, cold and foggy even for the North Atlantic and gulf of Maine. Henry C. Taylor's big yawl "Baruna," winner of the 1938 Bermuda race, was the victor by several hours. James E. Grove's cutter "Blitzen" was second and the prize for the smaller Class B boats was taken by Robert F. DeCoppet's new Luders-designed sloop "Coquette."

On the Great Lakes, long distance contests continued to be very popular. The famous Chicago-Mackinac race drew a record number of 52 starters. Light, variable winds prevailed over most of the 331-mi. course, and Theodore Lumbard's ten-year-old sloop "Bangalore" repeated her victory of the previous year, with the week-old yawl "Tahana," also designed by Rhodes, close behind her in second place. C. Peterson's "Batavia" was third in the fleet and first in Class A. The Detroit-Mackinac race was also well attended and, in contrast, was one of the fastest ever sailed. The winner, James R. Lowe's big Chicago yawl "Manitou" set a new record, sailing the 237-mi. course in less than 33 hours. David Williams's "Sonata" was second.

The Freeman Cup race on Lake Ontario, the Stamford Yacht club's Vineyard race, the Eastern Yacht club's race from New London to Marblehead and the racing cruises of the Eastern, New York, American and Indian Harbor yacht clubs all brought out fine fleets of cruising type yachts. In most of them the honours were divided liberally, although Frank C. Paine's "Gypsy" took both the Eastern Yacht club events.

At such centres as western Long Island sound, and Marblehead, Mass., where class racing has flourished for decades the sport was continued on about the same scale as in years immediately preceding although the trend away from the larger, more expensive, classes continued. On the Sound three 12-metres raced hard throughout the season, but the next smaller one-design or rule class which raced consistently was the scrappy International, barely 30 ft. in overall length.

At Marblehead the 8-metres were the only really large class competing regularly.

In contrast to the situation in the long established centres, small boat racing continued to grow on the Great Lakes, on Chesapeake bay, in the south, on the west coast and particularly on hundreds of inland lakes, both natural and man-made. The class organizations of the smaller nationwide one-design classes such as Comets, Snipes, Lightnings and Stars, have played a big part in this small boat development. On the lakes of Wisconsin and Minnesota interest in the various Scow classes continued to grow with 150 turning out for the championship events on Lake Mendota.

On the Pacific coast the lack of extensive sounds and bays seems to have retarded the progress of cruising type racing as compared to that on the Atlantic coast and the Great Lakes. Southern California, however, has come rapidly to the fore as the country's leading large racing class stronghold. M class yachts, 10-metres, 8-metres, 6-metres and their own Rhodes 33's all mustered good fleets in the 1940 racing.

In spite of the war clouds the world championship of the Star class preserved some of its traditional international flavour with 14 entries from the various U.S. fleets, two from Hawaii, and one each from Cuba and Nassau. A closely contested series of five races was sailed at San Diego with two young Los Angeles skippers, James and Gordon Cowie, bringing their "Rambunctious II" through on top.

The year saw a steady and great increase in the activities of the Inter-Collegiate Yacht Racing association. Contests in sailing dinghies flourished on spring and fall week-ends at scores of colleges and universities in the east and middle west and, thanks to the extensive facilities provided by the Massachusetts Institute of Technology on the Charles river, over 20 teams participated in the Boston Dinghy Cup series in late October. This was won by Princeton. The big event of the spring season was the association's big boat championship in which Williams retained its title defeating four other finalists, Yale, Harvard and the Coast Guard and Naval academies.

(H. L. St.)

Yale University. During the academic year 1939–40 the tenth college for undergraduates, Silliman college, made possible by the bequest of Frederick W. Vanderbilt, Ph.B., '76, was completed and two reorganized university departments, one in the history of art, the other in music, were established to provide courses for undergraduate majors and direct work leading to the master's and doctor's degrees.

Dr. Harvey Cushing, who died during the year, gave to the school of medicine his brain tumour registry which embodies his recorded clinical experience of more than 40 years and to the medical library he gave his unrivalled collection of medical and scientific classics. Work was begun on the extension of the library wing of the Sterling hall of medicine to house the Yale medical library.

Gifts and bequests received by the university during the year ending June 30, 1940, totalled $3,807,117; gross additions to funds were $2,860,152, including interest on certain funds; total endowment and reserves were (1941) $110,541,766, with a net after investment losses of $101,075,903. In addition, the Sheffield Scientific school trustees have assets of a book value of $2,837,697.

Outstanding new appointments and promotions for the year were: Leonard Bloomfield, Sterling professor of linguistics; Charles W. Hendel, professor of moral philosophy; Edmund W. Sinnott, Sterling professor of botany; Bronislaw K. Malinowski, Bishop museum professor of anthropology; Professor Filmer S. C. Northrop, master of Silliman college; Professor Ashbel G. Gulliver, dean of the law school. (C. A. L.)

DESPITE A BROKEN SPINNAKER POLE, Harold S. Vanderbilt's "Vim" won the annual regatta of the New Rochelle Yacht club in Long Island sound June 29, 1940

Yellin, Samuel (1885–1940), U.S. metal worker, was born in Poland, March 2 and began studying art at the age of 11. He went to the United States in 1906 and engaged in the production of decorative metal work. Examples of his handicraft are in the Harkness quadrangle at Yale university, the National cathedral in Washington, D.C. and the Cathedral of St. John the Divine in New York city. He received the Bok award in 1925 as the citizen who had done the most distinguished work in Philadelphia during the previous year. He died in New York city, Oct. 3.

Yemen: *see* Arabia.

Yonai, Mitsumasa (1880–), Japanese admiral and prime minister from Jan. 14 to July 16, 1940, was born at Iwate-ken and was graduated from the Japanese naval academy in 1901. After commanding various warships he was promoted to chief of staff of the second fleet, then joined the staff of the naval board. Minister of the navy from 1937 to 1939, he was named supreme war councillor in August of the latter year. After the resignation of Gen. Nobuyuki Abe early in 1940 Yonai was commissioned to form a new government. A political stop-gap, his cabinet was succeeded in July by that of Prince Konoye (*q.v.*).

Young Men's Christian Association.

The World's Alliance of Young Men's Christian associations was formed in 1855. It is composed of 36 autonomous national alliances and associations in 28 other countries affiliated informally. The headquarters of its world's committee and executive are located at Geneva, Switzerland. Its 21st world's conference met in Mysore, India, in Jan. 1937. A World's Young Men's conference met at Amsterdam, following the World Conference of Christian Youth in June 1939. Last available reports (Jan. 1, 1939) showed 10,500 associations with 1,960,226 members, predominantly young men and boys. A body of secretaries or professional workers numbering 6,002 was reported. Concerns of immediate importance to the alliance include the menace of war, participation in direct war-service by various national alliances, and reciprocal service to war-prisoners under World's Alliance auspices; the contribution of Christian youth to a peaceful world order; public policies affecting the place and opportunity of youth; and the emergence of a universal Christian community. Publications: *Youth in the New World, Flaming Milestone, World's Youth,* a quarterly journal, are published by the World's Committee, Y.M.C.A., Geneva; *Y.M.C.A. Year Book for 1940,* National Council, Y.M.C.A., New York. (O. E. P.)

Young Men's Hebrew Association and **Young Women's Hebrew Association:** *see* JEWISH WELFARE BOARD.

Young Women's Christian Association.

The 16th national convention of the Y.W.C.A.'s of the U.S.A. met in Atlantic City, N.J. in April, 1940, bringing together delegates from 44 states, the Hawaiian islands and 10 other countries. The year 1940 marked for the Y.W.C.A. the completion of 85 years of service to women and girls, begun in London in 1855. This anniversary was the occasion for a special celebration at the convention, during which a broadcast by Queen Elizabeth of England was heard. The concern of the Y.W.C.A. in the United States for member associations in countries affected by the war became intensified as the year progressed. Special funds were raised to help associations in China and Europe not only to carry on their regular work but to provide an emergency program including the giving of aid to refugees, assisting in the rehabilitation of evacuees from war zones, and similar activities. In the autumn a temporary branch office of the world's headquarters in Geneva, Switzerland, was opened in Washington, D.C., to facilitate communications with countries in which the Y.W.C.A. is at work.

In the United States the recreation, education and fellowship programs of the more than 1,400 local centres were participated in by more than 3,000,000 women and girls. (M. S. Ss.)

AS A PROTEST against procommunist inclinations of the National Youth congress in Feb. 1940, these young men and women called on their fellow delegates to avoid all foreign "isms"

Youth Movements are an organized effort at political, cultural and social self-expression of young people. In totalitarian states these youth movements are strictly regimented and made completely subservient to the aims of the state. This is the case in Germany, Italy and Russia, and has lately been imitated in other states like Rumania and France, when they came under fascist control. With her fascistization Japan began to institute a similar youth movement. Fumio Goto, the director of the planning board of the new totalitarian party in Japan, declared that 60,000 young leaders were to be recruited from the nation's youth for the future leadership of totalitarian Japan, following the example set by national socialist youth education. In Nov. 1940 the soviet union mobilized 500,000 young people between 14 and 17 years to form a semi-military state labour reserve corps. Each year about 800,000 to 1,000,000 boys will be called up for compulsory courses varying from six months to two years, after which time they will do four years' work under state order. At the same time the need for strict discipline among the "Pioneers," the youngest branch of the communist youth movement, was emphasized, and children were ordered to respect adults and to devote their play to military games and to sports which would prove useful in case of war.

The leader of the German youth movement, Baldur von Schirach, was made provincial governor of Vienna, but retained his position as head of the education of youth and inspector of the entire Hitler youth organization. His successor as active head of the Hitler youth was Arthur Axmann.

In view of the complete regimentation and militarization of the soviet youth and of the immense importance which military conscription plays in the soviet "democracy," it was astonishing that the American communist youth and the several youth organizations where it had influence objected violently to the introduction of conscription in a much milder form in the United States. Only a very small part of American youth was in 1940 organized in youth movements, of which many, like the Boy Scouts and different church groups, were entirely apolitical. On the other hand, some of them tried to play a definite political role, among them the American Youth congress, which was established in the summer of 1934 and which formed in 1940 the centre of much controversy. Its opposition to conscription and to aid for Great Britain led to a split on occasion of its 6th national meeting in July at Lake Geneva, Wis. During the Christmas period the annual conference of the American Student union followed the line of the American Youth congress, and protested President Roosevelt's foreign policy, while at its conference the National Student Federation of America, one of the founders of the American Youth congress, withdrew from this organization on the issue of the latter's alleged radical tendencies.

(H. Ko.)

Yugoslavia, a kingdom in southeastern Europe, with an area of 95,558 sq.mi. and a population of about 15,800,000. In view of the minority of King Peter II, his uncle, Prince Pavel, is the regent. The population of Yugoslavia is southern Slav, divided into three branches—the Greek Orthodox Serbs, who have lived for many centuries under Turkish domination; the Catholic Croats, who are racially and linguistically

identical with the Serbs, but differentiated through history and religion, having lived for centuries in contact with and under Vienna; and to the northwest of them the Catholic Slovenes, speaking a somewhat different language. In addition there are Mohammedans who in spite of their religion are largely of Slav origin, small German and Hungarian minorities, and a larger Bulgarian minority in Macedonia.

Yugoslavia, which was formed after the War of 1914–18 by the addition of the formerly Austrian territories of the Slovenes and the Croats, and of Montenegro, to the Serbian kingdom, suffered for many years from the antagonism between the Serbs who wished a centralized kingdom under their predominance and the Croats who pleaded for equality of the three branches of the southern Slav race and for Croat autonomy. This long dispute was terminated on Aug. 25, 1939, when an understanding was reached between the Serbs and the Croats, the reintroduction of democracy and free elections was promised, the Croatians received a fair measure of autonomy with their own diet, and the leader of the Croats, Dr. Vladimir Matchek, became vice-premier in a coalition cabinet headed by Dragisha Cvetkovitch. An official visit by the prince regent on Jan. 14 to the Croat capital, Zagreb, confirmed the new friendship.

The main concern of Yugoslavia during 1940 was, in view of the European war, the foreign policy. Yugoslavia pursued a policy of strict neutrality, although it leaned towards the axis, partly out of weakness and geographic conditions, partly out of the inclinations of a certain group of political leaders like the former Prime Minister Milan Stoyadinovitch and the Slovene leader Father Anton Koroshetz, the minister of public education and president of the senate, who died on Dec. 14, 1940. At the conference of the Balkan Entente in Belgrade at the beginning of February, Yugoslavia opposed all moves towards stronger Balkan solidarity against any outside aggression, and generally took a line in harmony with Italy. But the Belgrade government took energetic measures when in the middle of April the Yugoslav police unearthed a fascist plot under the leadership of Dr. Milan Stoyadinovitch, who was exiled from the capital to a distant provincial town as a result. The great successes of Germany in the late spring, Italy's entrance into the war, and France's surrender, induced Yugoslavia to follow a more cautious policy and to release Dr. Stoyadinovitch. The grave reverses suffered by the Italian army in her war against Greece awakened in the Yugoslav army and the war minister, General Milan Neditch, the desire for an active policy on the part of Yugoslavia to prevent a fate similar to that which had befallen Rumania, but the tendency of Father Koroshetz prevailed, General Neditch resigned, and Yugoslavia emphasized her sympathy with the axis powers, leaving it undecided by the end of 1940, in spite of some solemn declarations, whether Yugoslavia would offer armed resistance to any advance of German or Italian troops into the country's territory. A commercial pact with Germany of Oct. 19 subordinated Yugoslav economic life to the exigencies of German economy. At the beginning of December the Hungarian Foreign Minister Count Csaky visited Belgrade and concluded on Dec. 11 a treaty of "everlasting friendship" between the two countries, the true impact of which only future events would reveal. (*See* also BALKAN ENTENTE; EUROPEAN WAR; LITTLE ENTENTE.) (H. Ko.)

Yukon Territory, the most westerly of the northern territories of Canada, was created a separate territory in June 1898, by act of parliament (the Yukon act). It has a total area of 207,076 sq.mi., and a population of 4,000 (estimate, Dominion Bureau of Statistics, 1935). At the height of the gold mining boom (1901) the population was 27,219. The seat of government is Dawson.

By amending legislation, provision has been made for a local government composed of a chief executive, the controller, and an elective legislative council of three members with a three year tenure of office. The controller administers the government of the territory under instructions from the governor-general-in-council.

Mining is the chief industry, closely followed by trapping, and some fishing. In 1939 the Yukon (together with the Northwest Territories) produced $7,034,291 worth of minerals and over 60,000 fur pelts. (J. T. C.)

Zanzibar and Pemba: *see* BRITISH EAST AFRICA.

Zimmermann, Arthur (1859–1940), German diplomat, was born at Frankenstein, May 8, and died in Berlin, June 6. For a biographical sketch see *Encyclopædia Britannica,* vol. 23, p. 950.

Zinc. Of the current world zinc output, one-half of the producing countries account for 90% of the total, and the other half for 10%. The details for the major countries are shown in the accompanying table.

World Production of Zinc
(In thousands of metric tons)

	1929	1932	1937	1938	1939
Australia	50.8	53.7	70.9	70.9	70.8
Belgium	197.9	96.3	225.6	210.4	185.7
Canada	78.1	78.2	143.9	155.7	161.8
France	91.6	49.3	60.4	62.2	60.3
Germany	102.0	42.0	163.3	192.5	212.3
Norway	6.4	40.1	41.3	46.5	45.0
Poland	169.0	85.0	109.3	110.8	117.9
U.S.S.R.	3.4	13.7	70.0	80.0	90.0
United States	573.0	193.7	534.9	414.6	488.3
United Kingdom	59.2	27.3	63.1	56.2	50.4
World Total	1,472.8	789.9	1,667.9	1,589.7	1,678.1
Ex. U.S.	899.8	596.2	1,133.0	1,175.1	1,189.8

World zinc output increased by 6% in 1939, to a total of 1,678,100 metric tons, the increases being chiefly in the United States, Germany, Mexico, Poland, Canada and Spain, partially offset by decreases in Belgium, Great Britain, the Netherlands and France.

Production data for 1940 are limited to the United States and Mexico.

Domestic primary zinc production in the United States in 1940 increased by 20% to a new record at 643,400 short tons, in addition to which there was an appreciable output from foreign ores. Ores imported for consumption in the first 11 months of 1940 had a zinc content of 42,300 tons, and ores for processing and export a content of 61,900 tons. Shipments to consumers also made a new record at 696,500 tons, up 16% from 1939. Stocks at the end of 1940 were only 12,900 tons, 10% of the amount held in 1938.

Mine production of zinc in Mexico during the first seven months of 1940 was down 29% from the same period of 1939, to 64,250 metric tons; much of this is smelted in the United States.

Through occupation of the countries, Germany gained control of 213,000 metric tons of smelting capacity in Belgium, 112,000 tons in Poland, 61,000 tons in France, 47,000 tons in Norway, and 26,000 tons in the Netherlands, a total of approximately 460,000 tons, but mine production is limited to about 70,000 tons, mostly in Poland, and all sources of imported ores were by Jan. 1, 1941, cut off. (G. A. Ro.)

Zinsser, Hans (1878–1940), U.S. bacteriologist, was born in New York city, Nov. 17. He was graduated from Columbia university in 1899 and from the college of physicians and surgeons there in 1903. He served as a hospital in-

tern for two years, then began his career as a bacteriologist at the Roosevelt hospital and at Columbia university in New York city. He taught bacteriology in Stanford university for three years from 1910 and was then professor of bacteriology for 10 years at Columbia. In 1923 he was made professor of bacteriology and immunity in the medical school of Harvard university. He was a member of the American Red Cross sanitary commission to Serbia in 1915 and in 1917 entered the medical corps of the United States army as a major, and was later promoted to the rank of colonel. In 1923 he was sanitary commissioner in Russia for the League of Nations health section. He was a member of many scientific and learned organizations. Besides two books on bacteriology he wrote *Rats, Lice and History* and an autobiography, *As I Remember Him*, each of which had a large popular sale. He died in New York city, Sept. 4.

Zirconium. The use of zirconium as pure metal and as a ferro-alloy has been increasing, but the main consumption is in enamels, welding-rod coating, and as a refractory. Production is largely in Australia, Brazil and India. Imports of ore into the United States have declined heavily since 1937 and were only 1,483 short tons in 1939, while imports of ferro-alloys were 400 tons. Ore imports were mainly from Australia and alloys were almost entirely from Norway. (G. A. Ro.)

Zoological Gardens. The San Diego, Calif., Zoological society offered two scholarships of $1,000 each in 1940 for advanced graduate students to work at the research laboratory. Dr. Wedgeforth, president of the Zoological society of San Diego, visited Bengal, India, to collect specimens. By the generosity of Harvey Firestone, an expedition visited Liberia to collect wild animals, led by William S. Mann, director of the National Zoological park. Among animals sent from South America to New York city were 24 two-toed sloths.

Europe.—The Zoological society of London lost a valuable friend and former president by the death of the duke of Bedford. Martin Duncan, librarian, retired and F. G. Boulenger went to the war office. Officers of the Royal Tank corps adopted three giant tortoises, and Lord Moyne readopted some Dutch East Indian animals he had presented. There were 350 animals adopted.

In August the zoo opened to the paying public on Sundays. All forces in uniform enter free on Sundays and at half price on week-days. "Pigeongrams," in aid of the Red Cross, were instituted in June. A recruiting tent for the Women's Land army was opened and a War Utility exhibition held to encourage gardening, anti-waste and keeping useful animals.

Whipsnade opened on Feb. 1 and had 11,000 visitors on Easter Monday. The adult giant panda died and the baby giant panda returned to the London zoo.

About 20,000 evacuated children visited Brighton aquarium before it closed (after 100 years) and sent its rare tropical fish to the London zoo. When Maidstone zoo reopened in March, all forces in uniform were admitted at half price. Dudley zoo, with the aquarium restocked, opened as usual, and an adoption scheme enabled Chester to continue.

The Scottish National Zoological park admits all forces in uniform free. Work will not begin on the Glasgow zoo until peace is restored. At Dublin a new bison enclosure was finished and open-air quarters for lions begun. Two llamas and a Highland heifer were acquired from the Edinburgh zoo.

Paris zoo aquarium distributed its reptiles to the Marseilles zoo and its fish to the prince of Monaco's aquarium at Monte Carlo and to private people. Captain Jean Delacour gave a party in aid of the Red Cross at his zoo in June. Warsaw zoo, built at great cost, has, under German rule, been converted into a pig-fattening farm. In Germany the Berlin aquarium closed and its reptiles were destroyed. Zoo carnivores were rationed to five horses a day instead of six, and apes had dried fruit instead of bananas. Hamburg disposed of its collection, and Dinslaken zoo was converted to rear rabbits, poultry, pigs and silkworms.

Asia.—Bombay zoo sold surplus lions and tigers. Since gorillas are expensive to procure and maintain, the Madras zoo set up a life-sized statue in realistic surroundings instead.

Africa.—The Pretoria zoo, opened in 1899, one of the oldest in Africa and the oldest in the Union of South Africa, continued with part of the building scheme held up when war broke out. R. Bigalkie, the director, published *Animals and Zoos Everywhere*.

Australia.—The Adelaide zoo acquired a short-nosed bandicoot, a rare animal which used to be common. At Yanchep several thousand eucalyptus trees were planted for the koalas on show there. (V. R.)

Zoology. **General.**—The American Society of Zoologists held its annual meeting at Philadelphia, Pa., on Dec. 30 and 31, 1940, and Jan. 1, 1941. At that meeting 333 papers were listed of which 26% was devoted to general physiology; 22% to endocrinology; 19% to ecology, morphology and miscellaneous; 17% to embryology; 9% to cytology; 5% to cellular physiology; and 2% to protozoology. In addition, animal genetics was represented in meetings of the Genetics Society of America by 99 papers, and animal ecology in meetings of the Ecological Society of America by 49 papers. Also, there were three general symposia of zoological interest: (1) "Population Problems in Protozoa"; (2) "Endocrine Control of the Mammalian Reproductive Cycle"; and (3) "Human Ecology."

Major Trends.—The year 1940 witnessed general trends in zoology that were largely continuations of research already in progress. Certain of these trends may be indicated as follows:

(1) The interest of geneticists, embryologists and biochemists in the chemical aspects of differentiation and growth continued as an active phase of zoological experimental science. A newly formed organization, the Society for Development and Growth, held its second summer meeting at Salisbury Cove, Me., where a number of topics relevant to this trend were discussed.

(2) The active interest in animal populations continued apace. The symposium mentioned above on Protozoa was one evidence for this trend. The literature was increased by a number of papers dealing with both genetic (hereditary) and ecological (environmental) aspects of populations.

(3) Taxonomy and evolution received two notable stimuli during 1940. One was the publication of an English book edited by Huxley entitled *The New Systematics* that brought together and synthesized a wealth of important material about evolutionary facts and concepts. The other was the formation of a new American society, Association for the Study of Speciation, designed to organize and unify a diverse group of biologists interested in such problems. The population approach received ample recognition in both these enterprises and thus drew closer to modern evolution studies.

(4) There was a heightened interest in the effect of hormones on behaviour responses. The zoologists' symposium on mammalian reproduction had papers concerned with this phase of zoology.

(5) A significant development was the sharpened interest of zoologists in the biology of social problems and society. This trend has been developing since 1930 and reached perhaps its peak in 1940. A distinguished symposium called "The Biological Basis of Social Problems" was held in Monterey, Calif., and was well received. The proceedings of the symposium were published in the *American Naturalist* (Sept.–Oct. 1940).

Specific Contributions. —*Endocrinology.*—Much evidence has accumulated showing that the sex glands of many vertebrates are under the close control of internal chemical activators known as hormones. Until recently it has been supposed that most invertebrates lack this type of mechanism—in short, that sex differentiation due to hormones was uniquely a property of the back-boned animals. A study reported by Pfeiffer in 1940 alters this picture since she describes such a hormone effect in the female locust, *Melanoplus differentialis*. In these studies it is demonstrated that a small, glandular, bilobed body lying in the head dorsal to the gut and known as the corpora allata secretes a substance into the blood that (a) stimulates the production of a secretion in the egg-tubes or oviducts and (b) permits the eggs to develop. When the gland is surgically extirpated these two normal functions fail. If only one lobe of the gland is removed the other lobe compensates or overgrows and there is no impairment of sex activity. When the corpora allata were removed from male locusts no effects on the male genital tract could be detected. However, it was proved that the gland's secretion was not sex specific by the following experiment. Female grasshoppers had their corpora allata removed and destroyed. Then the loss of these glands was rectified by implanting, as grafts into the female, corpora carefully removed from males. In these cases where the latter grew or "took," the females' oviducts and eggs developed normally. In short, the male corpora allata has the capacity for supplying the hormone needed by the female.

Animal Behaviour.—"Behaviour problems can be attacked experimentally through endocrine manipulation." A new study that falls into this category on the sword-tail (*Xiphophorus helleri*) was reported by Noble and Borne. In various birds, as well as certain fish, a social order or "hierarchy" exists in which a dominant or despot animal pecks on contact a subordinate member of the population. This pecking behaviour brings a certain social order into the group. Noble was able to change the pecking orders within a school of female sword-tails by injecting certain fish with vertebrate male hormone, testosterone propionate. A subordinate fish is treated on alternate days. After about 12 days the fish becomes more aggressive and soon attains a higher place in the group peck-order than she had before treatment. By "higher" is meant that she now dominates fish which previously dominated her. If hormone treatment is continued the fish develops rudimentary male structures (*e.g.*, a tail "sword") as well as male behaviour. She may attempt unsuccessfully to copulate with the remaining females. Noble points out that sex hormones cause ". . . female sword-tails to rise in their social hierarchies only by bringing a reversal of sex."

Phylogeny.—In an important paper on the primitive animals known as "Protura," Ewing holds that these forms and true insects had a common "hexapod" ancestor. He proposes the following classification of the six-legged Arthropods: Superclass, Hexapoda; Class I, Collembola; Class II, Protura; Class III, Insecta; Subclass I, Thysanura and Subclass II, Pterygota. (*See* BACTERIOLOGY; ENTOMOLOGY; OCEANOGRAPHY; PALAEONTOLOGY.)

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